

The Legal Protection of Freshwater Resources and Related Installations during Warfare

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Abstract

Armed conflicts have an impact on freshwater resources and often damage water installations, which could be targeted or incidentally damaged, affecting water quality and quantity and limiting access for the civilian population. Thus, in situations of armed conflict, protecting freshwater resources and related installations becomes essential. International humanitarian law (IHL) and international environmental law (IEL) provide for relevant rules that limit the impact of armed conflicts on freshwater and water infrastructure. IHL protects civilian objects, objects indispensable to the survival of the civilian population, works and installations containing dangerous forces and the natural environment. It also prohibits employing poison or poisonous weapons and environmental modification techniques. IEL regulates the sustainable and environmentally sound use, development and management of water resources. Progress in the realm of the human right to water and the rise of environmental consciousness further necessitate an eco-friendly approach that recognizes comprehensive protection. Therefore, this article examines the interplay between IEL and IHL, explaining how IEL can contribute to the interpretation of IHL rules and exploring areas where IEL could complement IHL rules relevant to the protection of freshwater resources and related installations during warfare.

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The authors would like to thank Karen Hulme, Jérôme de Hemptinne, Raphaël van Steenberghe and the anonymous reviewer for their insightful comments on an earlier draft. We also extend our gratitude to the JICJ editorial team for their thoughtful and invaluable feedback, guidance, and support.

1. Introduction

Freshwater is indispensable for the well-being of humans, ecosystems, flora and fauna. It is also the lifeblood of almost all economic activities, including agriculture, energy production and industry. Water represents a biological, social, economic and spiritual necessity for society. Recently, some states, through domestic rulings and legislation, have attributed legal personality to rivers, for example the Atrato River in Colombia or the Whanganui River in New Zealand.¹ Freshwater often flows in transboundary waters. Some 310 transboundary rivers serve almost 40% of the world's population and, of these rivers, 180 feed two states, while the others feed three states or more.² This necessitates an integrated freshwater use and management, including tackling pollution, between basin states. All these examples show the importance of protecting freshwater resources for their own value and not only for the benefit of human beings.

Armed conflicts affect freshwater resources and related installations in several ways. First, they may threaten the quality of the waters in rivers, lakes and groundwater resources shared by two or more states. Second, they may threaten specific aquatic ecosystems such as wetlands. Third, warfare may affect the quantity of water, reducing water tables or the flow of rivers. Fourth, military operations often damage installations, works and facilities connected to transboundary waters, such as dams, which provide access to freshwater supplies. Over the past decades, several international organizations have been monitoring the impacts of conflict on water and other development indicators. For instance, since 1999, the United Nations Environment Programme (UNEP) has carried out several post-conflict environmental impact assessments highlighting the degradation of freshwater resources, the lowering of water tables caused by over-exploitation or unregulated uses as well as the repercussions of military operations on the functioning of water services, in particular, in cities.³ The World Bank reported that armed conflicts significantly affect water supply systems and irrigation infrastructure and severely erode institutional water management and service delivery capacities.⁴ The United Nations Children's Fund (UNICEF) report pinpoints that children in prolonged conflicts are more likely to die from diseases linked to the lack of clean water

- 1 Constitutional Court of Colombia, T-622/16 *Center for Social Justice Studies et al. v. Presidency of the Republic et al.* (2016); and Te Awa Tupua (Whanganui River Claims Settlement) Act 2017 (New Zealand) 20 March 2017.
- 2 The continent of Africa has 60 international watercourses, of which 11 affect 4 or more riparian states (including 11 states for the Nile and 9 for Congo). In America, the Amazon serves 7 states, and 6 Asian states share the Mekong. As for the Danube, its watershed is divided between no less than 17 states. See 'Transboundary Freshwater Spatial Database', Oregon State University, available online at <https://transboundarywaters.science.oregonstate.edu/content/data-and-datasets> (all websites visited 1 December 2022).
- 3 E.g. United Nations Environment Programme (UNEP), *Afghanistan: Post-Conflict Environmental Assessment* (2003), at 32–33.
- 4 C.W. Sadoff, E. Borgomeo and D. de Waal, *Turbulent Waters: Pursuing Water Security in Fragile Contexts* (World Bank, 2017).

than from violence directly related to the conflict, and the International Committee of the Red Cross (ICRC) noted an increase in attacks on water distribution systems and infrastructure — including dams, pipelines, water treatment plants — and underscored that having access to freshwater is increasingly a matter of survival.⁵ During the armed conflict against the Islamic State of Iraq and the Levant (ISIL) in 2016–2017, scorched earth tactics targeting Iraq's oil industry caused significant environmental damage to water resources, including the Euphrates and Tigris rivers.⁶ The UN Institute for Disarmament Research report identifies the damage to installations providing freshwater supplies as one of the key indicators in documenting the harm of explosive weapons.⁷ There are also reports of degradation of groundwater resources in occupied territories⁸ and severe impacts of using certain weapons, including depleted uranium, on water resources.⁹

Despite such significant adverse impacts of armed conflict on freshwater resources and related installations, international humanitarian law (IHL) does not provide specific protection for freshwater and related installations as such, and it only indirectly addresses their protection under general rules of conduct of hostilities and through principles protecting objects indispensable for the survival of the civilian population, works and installations containing dangerous forces (dams and dykes), and protection of the natural environment.¹⁰ These rules and principles are framed using vague and ambiguous language that makes it necessary to look into the interplay with other branches of law for interpretive guidance and to complement them.¹¹

- 5 United Nations Children's Fund (UNICEF), *Water Under Fire Volume 3: Attacks on Water and Sanitation Services in Armed Conflict and the Impacts on Children* (2021); and International Committee of the Red Cross (ICRC), 'Having Access to Water Is Increasingly a Matter of Survival in Conflict Zones', 21 March 2022, available online at <https://www.icrc.org/en/document/having-access-water-increasingly-matter-survival-conflict-zones>.
- 6 See UNEP, *Environmental Issues in Areas Retaken from ISIL: Mosul, Iraq: Rapid Scoping Mission* (July — August 2017) available online at https://wedocs.unep.org/bitstream/handle/20.500.11822/22434/environmental_issues_Isil_Iraq.pdf?sequence=1&isAllowed=y (visited 25 October 2022).
- 7 C. Wille and A.M. Baldo, *Reference Framework: Menu of Indicators to Measure the Reverberating Effects on Civilians from the Use of Explosive Weapons in Populated Areas*, The United Nations Institute for Disarmament Research (UNIDIR) (2020).
- 8 See D. Weir, *UN Report Details Environmental Degradation in West Bank and Gaza*, Conflict and Environment Observatory (CEOBS), 8 June 2020, available online at <https://ceobs.org/un-report-details-environmental-degradation-in-west-bank-and-gaza/>.
- 9 See UNEP, *Depleted Uranium in Bosnia and Herzegovina: Post-Conflict Environmental Assessment* (2003); and United Nations Environment Programme, *State of the Environment Report for Bosnia and Herzegovina* (2012), at 191–192.
- 10 See Arts 35(3), 51(4) and (5)(b), and 55, Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts, 8 June 1977, 1125 UNTS 3 ('AP I'); and J.M. Henckaerts and L. Doswald-Beck (eds), *Customary International Humanitarian Law* (ICRC, 2005), Rules 11, 12, 14, and 43–45.
- 11 See R. van Steenberghe, 'Interactions between International Environmental Law and International Humanitarian Law Regarding the Protection of the Environment during Warfare', in this issue of the *Journal of International Criminal Justice*.

In this regard, the legal protection under international environmental law (IEL), particularly international water law, is critical. Transboundary freshwater resources and related installations are protected under two global UN legal frameworks, namely the 1997 UN Convention on the Law of the Navigational Uses of International Watercourses ('UN Watercourses Convention') and the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes adopted under the aegis of the UN Economic Commission for Europe ('UNECE Water Convention').¹² Although this last instrument was initially crafted as a regional instrument only open to the UNECE's Member States, in 2016, the Convention was amended, and all UN Member States can now accede to it. While both conventions cover — to a different extent — groundwater resources, in 2008, the International Law Commission (ILC) adopted the Draft Articles on the Law of Transboundary Aquifers ('ILC Draft Articles'). These legal instruments do not explicitly exclude their application in time of armed conflict. In particular, both the UN Watercourses Convention and the ILC Draft Articles contain a provision referring to the application of 'principles and rules of international law applicable in international and non-international armed conflict', and explain that transboundary water resources and related installations 'shall not be used in violation of those principles and rules'.¹³ State parties to the UN Watercourses Convention include Iraq and Syria, where armed conflicts caused damage to water installations such as dams in the Tigris and Euphrates rivers.

Beyond these global UN instruments, states are often bound by various bilateral or multilateral freshwater agreements on specific rivers or lakes that they share with their neighbouring countries. Examples of these treaties include the Convention on cooperation for the protection and sustainable use of the Danube River of 1998, the Agreement on the Cooperation for Sustainable Development of the Mekong River basin of 1995 and the Senegal Water Charter of 2002. An element to highlight is that freshwater agreements usually establish joint institutional mechanisms to address transboundary water resources management issues, including controlling pollution to ensure the quality of freshwater resources.

This article will focus on freshwater resources and related installations and examine the relationship between the applicable freshwater law and IHL. While IHL focuses on the protection of civilians and civilian objects, freshwater law addresses the protection of freshwater for its own value. It highlights

12 Convention on the Law of the Non-Navigational Uses of International Watercourses, 21 May 1997, 2999 UNTS 77 ('UN Watercourses Convention'; as of November 2022, it has 37 parties); Convention on the Protection and Use of Transboundary Watercourses and International Lakes, 17 March 1992, 1936 UNTS 269, and Amendments to Articles 25 and 26 of the Convention, 2897 UNTS 92 ('UNECE Water Convention'; as of November 2022, it has 46 parties).

13 See Art. 29 UN Watercourses Convention; and *Report of the International Law Commission on the Work of its Sixtieth Session* (5 May–6 June and 7 July–8 August 2008), UN Doc. A/63/10 ('2008 ILC Report'), Art. 18. The full text of the draft articles on the law of transboundary aquifers is reported at §§ 53–54.

whether the protections under freshwater law, including relevant customary principles and agreements, continue to apply in armed conflict situations and the interplay between the relevant rules and principles of IHL and freshwater law. Though there are a significant number of bilateral and multilateral treaties on international watercourses, this article will mainly consider the two global UN instruments on freshwater, i.e. the UN Watercourses Convention, the UNECE Water Convention and the ILC Draft Articles. The article will also consider the practice of some joint institutional mechanisms in the case of armed conflicts and their role in building sustainable peace after an armed conflict. Finally, it provides suggestions on how the protection of freshwater resources and related installations in armed conflicts can be improved.

2. The Impact of Armed Conflicts on Freshwater Sources and Related Installations

Most of the available water (close to 98%) cannot be immediately consumed or used for irrigation, nor even used for industrial purposes, either because of too much salt or because it comes in the form of ice. In addition, while the world's population has tripled in the last hundred years, freshwater consumption has increased six-fold. In contrast, the capacity of freshwater reservoirs to rebuild is far from equating to the ever-increasing rate of exploitation. In this context of increased use of freshwater, armed conflicts jeopardize their use for the population — hindering access to drinking water for hundreds of millions of people living in conflict-affected areas and affecting the resource's environmental and spiritual value.¹⁴ Though there is no comprehensive overview of scientific evidence on the impact of armed conflicts on water resources and their management,¹⁵ we will try to broadly present possible impacts of armed conflicts on freshwater under four main categories: (1) effects on the quantity of freshwater resources; (2) effects on the quality of freshwater resources (e.g. pollution of rivers and groundwater with chemicals, including heavy metals); (3) effects on specific aquatic ecosystems such as wetlands; (4) effects on water installations, works and facilities (essential public services are interconnected and the installations or facilities providing these services are highly vulnerable to the impacts of armed conflicts).¹⁶

First, armed conflicts may amplify the risks of freshwater shortages (quantity) either by using water as a tool to achieve military objectives or destroying installations such as water supply lines or treatment plants. According to the ICRC, in Syria, 98% of people in cities and 92% of people in rural communities had reliable access to safe water before the armed conflict and, currently, only 50% of water and sanitation systems function

14 ICRC, 'Water — a Matter of Survival', *supra* note 5.

15 *Ibid.*

16 See e.g. SC Res. 2573, 27 April 2021.

properly.¹⁷ Most states affected by armed conflicts suffer from a severe freshwater shortage. For instance, all regions of Sudan have been affected, but the worst impacts have been felt in the central and northern states, where armed conflict has occurred.¹⁸ In Iraq, UNEP noted a general decline in water quantity due to sewage pollution of freshwater.¹⁹ Another effect of conflicts on water resources is population displacement, which significantly impacts unsustainable groundwater extraction in camps — supplied with water via a network of groundwater boreholes. Armed conflict also impacts water sharing and quotas in the context of transboundary nature of rivers, as the tensions between Lebanon and Israel over integrated water resources management and its sustainability epitomize.²⁰

Second, armed conflict may affect water quality (surface water and groundwater), e.g., when oil spills, chemicals, explosives weapons (and their residue), and hazardous waste from industries, sewage lines and waste disposal sites damaged by the conflict contaminate water sources.²¹ Targeting water treatment plants and pumping stations with reserves of toxic industrial chemicals and other industrial facilities often involves the risk of pollution of surface and groundwater resources. During the Kosovo conflict in 1999, toxic chemicals leaked into Danube River due to the airstrikes against industrial facilities alongside the river.²² Pollution of transboundary rivers and groundwaters also affects neighbouring states. Even small amounts of hazardous substances released into waters can cause significant environmental damage with far-reaching and long-term effects. For these reasons, freshwater pollution prevention, reduction and control are essential in freshwater agreements. Both UN global water conventions explicitly mention the obligation to take all appropriate measures to prevent, control and reduce pollution of waters causing or likely to cause transboundary impact.²³ Also, the contamination of water resources and incidence of waterborne diseases is a recurring theme in situations of armed conflicts. For example, in Sudan, in 2007, it was reported that 80% of reported diseases in the country were related to water.²⁴ In Somalia, the civil war led to the extensive destruction of the water supply system,

17 ICRC, 'Syria Water Crisis: Up to 40% Less Drinking Water after 10 Years of War — Syrian Arab Republic', 1 October 2021, available online at <https://reliefweb.int/report/syrian-arab-republic/syria-water-crisis-40-less-drinking-water-after-10-years-war>.

18 UNEP, *Sudan: Post-Conflict Environmental Assessment* (2007), at 111.

19 UNEP, *Desk Study on the Environment in Iraq* (2003), at 30.

20 UNEP, *Lebanon: Post-Conflict Environmental Assessment* (2007), at 128; and P.M. Link, J. Scheffran and T. Ide, 'Conflict and Cooperation in the Water–security Nexus: A Global Comparative Analysis of River Basins under Climate Change', 3 *Wiley Interdisciplinary Reviews: Water ('WIRES Water')* (2016) 495–515.

21 See J. Schillinger et al., 'Water in War: Understanding the Impacts of Armed Conflict on Water Resources and Their Management', 7 *WIRES Water* (2020) 1–19, at 9–14; and N. Solomon et al., 'Environmental Impacts and Causes of Conflict in the Horn of Africa: A Review', 177 *Earth-Science Reviews* (2018) 284–290, at 286.

22 See UNEP, *The Kosovo Conflict: Consequences for the Environment & Human Settlements* (1999), at 4.

23 See Art. 2(2)(a) UNECE Water Convention; and Art. 21(2) UN Watercourses Convention.

24 See UNEP, *Sudan*, *supra* note 18, at 111 and 129.

leading to cholera outbreaks affecting 55,000 people.²⁵ Likewise, in Yemen, the armed conflict crippled water supply systems 'leading to the country's worst cholera outbreak in modern history (2.5 million cases reported, and more than 4,000 people have died)'.²⁶ In armed conflicts, there is usually a lack of information and baseline data regarding water quality and quantity, making it difficult to adequately assess the impact and the likely changes that may occur.²⁷

Third, armed conflicts may affect freshwater ecosystems such as wetlands. An ecosystem consists of interdependent living and non-living components that function as a community.²⁸ During the 1980–1988 war with Iran, Saddam Hussein's regime saw the marshes as a refuge for internal opposition and its inhabitants were accused of treachery. Also, to flush out the rebels hiding in the reeds, the regime dammed the marshlands throughout the 1990s, and over 90% of the original marshlands were drained or destroyed. Consequently, the Marsh Arab community suffered socially and economically, about 40,000 people were forced to flee to southwest Iran, and hundreds of thousands were internally displaced.²⁹ Since the second decade of the 2000s, the Central Marshes, the Hammar Marsh and the Hawizeh Marsh have been part of the List of Wetlands of International Importance under the Ramsar Convention on Wetlands, which ensures international conservation management.³⁰ Another example where wetlands have been affected by armed conflicts is in Sudan. Sudan has some of the most extensive wetlands in Africa, and until the 2000s, only a tiny percentage of this vital habitat had any legal protection.³¹ Since June 2006, the Sudd wetlands have been listed as a site of international importance under the Ramsar Convention.

Fourth, armed conflict affects installations and works related to international watercourses. The term installations includes large projects such as dams and facilities like wells, aqueducts or canals, which may depend on freshwater flowing from or in transboundary water resources. Moreover, wastewater treatment plants may also contain substances which could harm freshwater resources. In many conflicts, from Iraq to Yemen, state and armed non-state actors ('ANSA') directly and indirectly targeted various civilian infrastructures, including water installations and facilities.³² Iraq has suffered from systematic

25 P. Gleick, 'Protecting the Environment in Times of War', *Bulletin of the Atomic Scientists*, 20 September 2019, available online at <https://thebulletin.org/biography/elfatih-a-b-eltahir/>.

26 ICRC, 'The Water Situation in Yemen', 5 June 2022, available online at <https://www.icrc.org/en/document/water-situation-yemen>

27 Schillinger et al., *supra* note 21.

28 See *Report of the International Law Commission on the work of its forty-sixth session* (2 May–22 July 1994), UN Doc. A/49/10 ('1994 ILC Report'), at 118. The full text of the draft articles on the law of the non-navigational uses of international watercourses and commentaries thereto is reported at § 222.

29 UNEP, *Iraq*, *supra* note 19, at 44.

30 'Iraq — Convention on Wetlands', available online at <https://www.ramsar.org/wetland/iraq>.

31 UNEP, *Sudan*, *supra* note 18, at 235.

32 See J. Sowers and E. Weinthal, 'Humanitarian Challenges and the Targeting of Civilian Infrastructure in the Yemen War', 97 *International Affairs* (2021) 157–177.

and extensive sabotage and looting by ISIL and airstrikes and military operations to recapture areas occupied by ISIL.³³ ISIL seized control of critical dams to exert hegemony over downstream cities and rural areas by either cutting off water supplies or releasing a flood wave to drown government-controlled areas. The 2014–2015 ‘drought’ in central and southern Iraq was largely a result of ISIL blocking water flows, and in 2014 ISIL flooded hundreds of square kilometres of agricultural land downstream of Fallujah and displaced thousands of people.³⁴ At one point, ISIL controlled dams along the Euphrates River from Tabaqa dam in Syria to Fallujah Barrage near Baghdad, and only Haditha, Iraq’s second-largest dam, remained under government control through the support of the US-led coalition.³⁵ In 2022, one of the first targets by the Russian force was to blow up a dam on the North Crimean Canal in the Kherson region. Ukraine built this dam in 2014 to cut off water to Crimea following the illegal annexation of the region. Russia and Ukraine have accused each other of targeting dams. For instance, Russia accused Ukraine of releasing water from the Oskil reservoir — one of its gates was destroyed on 2 April 2022 — to block the advance of Russia in the Donbas and of ‘preparing to blast’ dams and dikes along the Dnieper river.³⁶ Ukraine also repeatedly accused Russia of plotting to blow up and striking dams.³⁷

Freshwater agreements may include provisions on installations, works and facilities related to international watercourses. For example, Article 26 of the UN Watercourses Convention concerns the protection of installations — such as dams, barrages, dykes and weirs — from damage due to deterioration, the forces of nature or human acts, which may result in significant harm to other watercourse states. The UNECE Water Convention does not explicitly mention installations related to transboundary waters. However, its cornerstone obligations — to prevent, control and reduce transboundary impact, to ensure equitable and reasonable use, and to cooperate — provide a general framework that should govern the relations of parties when a new activity, including dams and other water installations, is planned.³⁸ The obligation not to cause transboundary damage is a cornerstone principle of IEL. States should protect freshwater

33 UNEP, *Environmental Issues*, *supra* note 6, at 2.

34 *Ibid.*, at 3.

35 *Ibid.*

36 N. Hildyard and J. Klemm, ‘Weaponising Water – Ukraine’s Dams Are Targets in Putin’s War’, EUobserver, 8 April 2022, available online at <https://euobserver.com/opinion/154675>; and A.E. Kramer, ‘They Flooded Their Own Village, and Kept the Russians at Bay’, *The New York Times*, 27 April 2022, available online at <https://www.nytimes.com/2022/04/27/world/europe/ukraine-russia-war-flood-infrastructure.html>.

37 ‘Ukraine’s Zelenskyy Accuses Russia of Planning to Destroy Dam’, *Aljazeera News*, 21 October 2022, available online at <https://www.aljazeera.com/news/2022/10/21/zelenskyy-calls-on-west-to-warn-russia-not-to-blow-up-dam>; and ‘Ukraine War: Houses Flooded after Missiles Hit Major Dam’, *BBC News*, 15 September 2022, available online at <https://www.bbc.com/news/world-europe-62910245>.

38 B. Libert and I. Trombitaia, ‘Advancing Dam Safety in Central Asia: The Contribution of the UNECE Water Convention’, in A. Tanzi et al. (eds), *The UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes* (2015) 394–407.

resources and installations related to international watercourses in times of armed conflict, in line with Principle 24 of the 1992 Rio Declaration. The objective to ensure the security of installations related to transboundary waters may also be served through the reference to the principles and rules of IHL, including the prohibition of poisoning, the protection of objects indispensable to the survival of the civilian population, and the protection of installations containing dangerous forces.³⁹

The various examples of the above section show the multiple dimensions of the impacts of armed conflicts on freshwater. IHL has mainly focused on protecting freshwater as an indispensable resource for the civilian population. The value of freshwater in itself is not taken into account under IHL. In this context, the international regulation applicable to freshwater resources (freshwater law) is of particular significance to protect freshwater for its own value.

3. The Interpretative Role of Freshwater Law with Respect to IHL

IHL is the principal body of law applicable in situations of armed conflicts. It has some general principles (e.g. distinction, proportionality and precaution) and detailed rules relevant to the protection of persons and objects during military operations, including occupation. Though often criticized as lacking specificity, these general principles offer protection for freshwater resources and related installations. There are also specific provisions relevant for the protection of such resources — for instance, as an object indispensable to the survival of the civilian population and installations, namely works and installations containing dangerous forces such as dams and dykes. Generally, freshwater resources and installations related to them are protected against attacks by existing fundamental principles of IHL applicable to both international armed conflict (IAC) and non-international armed conflict (NIAC) — the principles of distinction, proportionality⁴⁰ and precautions,⁴¹ even when they become a military objective.

The protections under IHL, however, do not apply in a vacuum, and need to be interpreted by reference to the legal framework in which they operate, including IEL. Principles of IEL have progressively made their way into managing freshwater resources, notably since the Stockholm Conference of 1972. Principles articulated in the 1972 Declaration on the Human Environment⁴²

39 Art. 56 AP I; Art. 15 AP II.

40 Art. 51(5)(b) AP I; and Henckaerts and Doswald-Beck, *supra* note 10, Rule 14. See also, M. Tignino and Ö. Irmakkesen, *The Geneva List of Principles on the Protection of Water Infrastructure: An Assessment and the Way Forward* (Brill, 2020), Principle 9, at 30–36.

41 Arts 57 and 58 AP I; and Henckaerts and Doswald-Beck, *supra* note 10, Rules 15–21 (precautions in attack) and Rules 22–24 (precautions against the effects of attacks).

42 Declaration on the Human Environment, *Report of the United Nations Conference on the Human Environment*, 5-16 June 1972, UN Doc. A/CONF.48/14/Rev.1, (1973) ('Stockholm Declaration').

and the 1992 Rio Declaration on Environment and Development⁴³ have become guiding standards for international agreements regulating the protection of freshwater resources. Freshwater law includes many principles of IEL, including prevention, precaution, ‘polluter pays’, due diligence and sustainable development.⁴⁴ This section focuses on the role that IEL principles may have in interpreting IHL rules.

A. IEL’s Preventive and Precautionary Principles

The principle of prevention is ‘the fundamental tenet on which international environmental law rests with its roots tracing back to the *Trail smelter case*’.⁴⁵ It has been included in several treaties,⁴⁶ recognized in case law, including in *Gabčíkovo-Nagymaros*⁴⁷ and *Pulp Mills*⁴⁸ cases related to transboundary waters and soft-law instruments.⁴⁹ This principle attained the status of customary international law.⁵⁰ Significant developments regarding measures to protect and prevent pollution at global, regional or national scales have generally occurred in reaction to incidents of extreme freshwater pollution. One example is the Baia Mare pollution incident in 2000 in which ‘the Aural mining company in Northern Romania spilt over 100.000 cubic metres of cyanide-polluted water into the Tisza river system’.⁵¹ This incident not only wiped out most of the fish stocks in the river but also threatened the drinking water supplies of the population downstream.

The UNECE Water Convention has the overarching aim to prevent and reduce pollution, which is based on the principles of prevention and

43 Rio Declaration on Environment and Development, *The United Nations Conference on Environment and Development*, UN Doc. A/CONF.151/26, 12 August 1992 (‘Rio Declaration’).

44 For example, Art. 4(f) and (g), Protocol for the Sustainable Development of the Lake Victoria Basin, 29 November 2003, available online at https://www.internationalwaterlaw.org/documents/regionaldocs/Lake_Victoria_Basin_2003.pdf (visited 15 November 2022); and Art. 16, Water Charter of the Senegal River, 28 May 2002, available online at <http://www2.ecolex.org/server2neu.php/libcat/docs/TRE/Full/En/TRE-153511.pdf> (visited 15 November 2022).

45 See *Preliminary Report on the Protection of the Environment in Relation to Armed Conflicts*, by Marie G. Jacobsson, *Special Rapporteur*, UN Doc. A/CN.4/674, 30 May 2014 (‘2014 Jacobsson Report’), § 133.

46 See e.g. Art. 2(1) UNECE Water Convention; Arts 7 and 21 UN Watercourses Convention; and Art. 2(1), Convention on Environmental Impact Assessment in a Transboundary Context, 25 February 1991, 1989 UNTS 309 (Espoo Convention).

47 *Case Concerning Gabčíkovo-Nagymaros Project (Hungary/Slovakia)*, International Court of Justice, 25 September 1997, ICJ Reports (1997) 7 (‘*Gabčíkovo-Nagymaros case*’).

48 *Case Concerning Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, International Court of Justice, 20 April 2010, ICJ Reports (2010) 14 (‘*Pulp Mills case*’), §§ 190–266.

49 Stockholm Declaration, *supra* note 42, Principle 21; and Rio Declaration, *supra* note 43, Principle 2.

50 2014 Jacobsson Report, *supra* note 45, § 134.

51 See R. Kinna, ‘The Development of Legal Provisions and Measures for Preventing and Reducing Pollution to Transboundary Water Resources under the UNECE Water Convention’, in A. Tanzi et al. (eds), *The UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes* (2015) 209–277, at 213.

precaution. These principles also take the form of the duty to conduct an environmental impact assessment (EIA) to assess the risk of harm to stop and/or mitigate any harm to freshwater which can be characterized as 'pollution', where the source and resulting harm occur across international borders. Given the development and codification of these rules in many international freshwater agreements, 'the obligation to prevent and abate transboundary water pollution' is an emerging, if not already established, customary international rule.⁵² In this regard, Article 2 of the UNECE Water Convention states that parties 'shall take all appropriate measures to prevent, control and reduce any transboundary impact'. Furthermore, this obligation applies to 'pollution of waters causing or likely to cause transboundary impact'.⁵³ IEL will guide parties — by way of principles such as the precautionary approach,⁵⁴ 'polluter pays'⁵⁵ and intergenerational equity — to fulfil their obligation to prevent, control and reduce any transboundary impact or pollution.⁵⁶

Thus, states should develop or reinforce measures against pollution, such as setting up water quality objectives and criteria, the prior licensing of wastewater discharges, and the monitoring and control of the authorized discharges. It is also important to apply the best available technology in the permitting process and implement the best environmental practices to reduce pollution. The application of EIA and the taking of specific measures contribute to the reduction of pollution. Countries should also aim at minimizing the risk of accidental pollution. In this context, the most relevant obligations are the obligation to develop contingency planning and to notify without delay of any emergency or critical situation.⁵⁷ This obligation of notification should be taken into account by a party to an armed conflict where there is a risk of pollution or damage to an installation which may cause a significant harm on other riparian countries (parties or not parties to the armed conflict). For example, an agreement between Russia and China in 2008 provides that:

Parties shall establish the systems of warning and exchange of necessary information for the prevention of emergency situations on transboundary waters and ensure their effective functioning. . . . In the event of an emergency situation, the Parties shall immediately notify each other and exchange relevant information, as well as take the required reasonable measures to eliminate or mitigate the consequences of an emergency situation.⁵⁸

52 UNEP, *The Greening of Water Law: Managing Freshwater Resources for People and the Environment* (2010).

53 Art. 2(2)(a) UNECE Water Convention.

54 *Ibid.*, Art. 2(5)(a).

55 *Ibid.*, Art. 2(5)(b).

56 *Ibid.*, Art. 2(5)(c).

57 Art. 28 UN Watercourses Convention.

58 Art. 6, Agreement between the Government of the Russian Federation and the Government of the People's Republic of China on the Rational Use and Protection of Transboundary Waters, 29 January 2008, available online at <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC094367/>.

As the UNECE Water Convention shows, the prevention principle applies to transboundary waters and focuses on harm based on knowledge or the ability to know, i.e., if the transboundary impacts of a given activity are known, preventive measures must be taken to avoid them. It is closely related to the principle of precaution,⁵⁹ though the aim of the latter principle includes addressing situations in terms of risk reduction, where scientific certainty on the effects of certain activities is not yet attained. The principle of prevention relies on knowledge-based risk calculation and the occurrence of damage is probable if no measure is taken. It calls for setting a regulatory framework to define preventive measures and determine acceptable risk. For instance, the UN Watercourses Convention requires states to ‘individually and, where appropriate, jointly, *prevent*, reduce and control the pollution of an international watercourse that may cause significant harm to watercourse states or to their environment, including harm to human health or safety, to the use of the waters for any beneficial purpose or to the living resources of the watercourse’.⁶⁰ It further provides that states should define mutually agreeable measures and methods to prevent, reduce and control pollution of an international watercourse, including setting joint water quality objectives and criteria, establishing techniques and practices to address pollution from point and non-point sources, and establishing lists of substances the introduction of which into the waters of an international watercourse is to be prohibited, limited, investigated or monitored.⁶¹

As far as applicable to an armed conflict situation, the principle of prevention could guide decision-makers (e.g. military commanders) in defining the precautionary measures they are required to take under IHL. Prior to armed conflicts (in peacetime), as enshrined under Article 58 of Additional Protocol I (‘AP I’), state parties need to take preventive measures to protect the civilian population, individual civilians and civilian objects, including freshwater resources and installations providing water supplies, against the (potential) dangers resulting from military operations.⁶² Moreover, the specific measures that could be taken with regard to essential freshwater resources and related installations (such as works and facilities providing water supplies) include marking them with distinctive signs, avoiding locating military objectives in their vicinity, and other preparedness measures to minimize or avoid damage.⁶³ As discussed below, this should encourage states to establish protected zones around freshwater resources and installations providing water supplies

59 2014 Jacobsson Report, *supra* note 45, § 137, ‘a separation of the two concepts is difficult to maintain when applying the principles’.

60 Art. 21(2) UN Watercourses Convention (emphasis added).

61 *Ibid.*, Art. 21(3).

62 Art. 58 AP I; Art. 13(1), Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of Non-International Armed Conflicts, 8 June 1977, 1125 UNTS 609 (‘AP II’); Henckaerts and Doswald-Beck, *supra* note 10, Rules 22–24; and ICRC, *Guidelines on the Protection of the Natural Environment in Armed Conflict* (2020) (‘ICRC Guidelines’), Rule 9.

63 See Tignino and Irmakkesen, *supra* note 40, at 40–42, Principle 11.

because of the potentially severe consequences attacks or damages to such works could cause.

IHL requires taking *constant care* to spare the civilian and civilian objects, including transboundary freshwater resources and connected installations, and take *all feasible precautions* to avoid, and in any event to minimize incidental loss of civilian life, injury to civilians and damage to civilian objects.⁶⁴ These measures should be understood as requiring taking into consideration the 'preventive' obligations enshrined under freshwater law. As Stefanik noted in relation to IEL, the obligations flowing from 'precaution in IHL would seem to suggest it has more of a preventive than precautionary nature, as a precaution is understood in the IEL context' and that IHL will benefit from the 'more detailed and more protective standards' under IEL.⁶⁵ This approach can also be applied to freshwater law. In the same vein, the World Charter for Nature proclaimed that 'nature shall be secured against degradation caused by warfare or other hostile activities' and that 'military activities damaging to nature shall be avoided'.⁶⁶ Broadly, the international community recognized the 'need to respect and protect the environment'.⁶⁷ Moreover, though IHL seems to distinguish the extent to which environmental considerations apply to international and internal armed conflicts, freshwater law does not as such make such distinction and could potentially be applied to all situations regardless of the type of conflict involved.⁶⁸ It should be mentioned, however, that ANSAs, compared to states, could be in a weaker position in the exercise of preventive duties to avoid harm to freshwater resources.

Even if the risk is known and preventive measures are taken, further precautionary measures might be necessary to reduce the probability of the risk if significant damage may occur to transboundary waters and related installations. As provided under Principle 15 of the Rio Declaration, 'to protect the environment, the precautionary approach shall be widely applied by states according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation'.⁶⁹ Thus, even in the face of scientific uncertainty, actions that present the potential for significant harm to transboundary freshwater resources and related installations must be abstained from.

64 Art. 57 AP I; Henckaerts and Doswald-Beck, *supra* note 10, Rule 15; and ICRC Guidelines, *supra* note 62, Rule 8.

65 K. Stefanik, 'The Environment and Armed Conflict: Employing General Principles to Protect the Environment', in C. Stahn, J. Iverson and J.S. Easterday (eds), *Environmental Protection and Transitions from Conflict to Peace* (2017) 93–118, at 113–115.

66 See UN General Assembly, *World Charter for Nature*, GA Res. 37/7, 28 October 1982, Principles 5 and 20.

67 See P. Antoine, 'International Humanitarian Law and the Protection of the Environment in Time of Armed Conflict', 32 *International Review of the Red Cross* ('IRRC') (1992) 517–537, at 520.

68 See UNEP, *Protecting the Environment during Armed Conflict: An Inventory and Analysis of International Law* (2009), at 47; and Art. 29 UN Watercourses Convention.

69 Rio Declaration, *supra* note 43.

As this principle has been applied in various contexts, its formulation often differs from agreement to agreement.⁷⁰ For instance, it is ‘often considered part of, or an essential feature of, sustainable development’.⁷¹ Regarding the legal status of the precautionary principle under IEL, it is attaining the status of customary international law.⁷² Treaties specific to freshwater resources also explicitly incorporated this principle.⁷³

The principle mainly requires taking preventive action in a situation of lack of scientific certainty, exploring a wide range of alternatives to harmful measures (e.g. applying the best technology available, performing EIAs, imposing environmental quality standards), and it shifts the burden of proof from the victims of harm. It also ‘implies the need for States to review their obligations of prevention in a continuous manner to keep abreast of the advances in scientific knowledge’.⁷⁴

Under IHL, the notion of precautions in attack is a well-established principle.⁷⁵ This principle should be considered in relation to transboundary freshwater resources and related installations. For example, states should gather intelligence on the potential impacts on transboundary freshwaters as part of the principle of precautions in attack.⁷⁶ In line with IEL’s precautionary principle, the ICRC indicated that under IHL, ‘lack of scientific certainty as to the effects on the environment of certain military operations does not absolve a party to the conflict from taking such precautions’.⁷⁷ This statement equally applies to freshwater law, which integrates the precautionary principle. It is indicated that ‘if the environmental effects of a particular activity are known, then the measures taken to avoid them are preventative only; if the effects are unknown, then the same measure can be labelled as precautionary’.⁷⁸ Transboundary freshwater resources and installations related to them should benefit from the application of preventive and precautionary protections, and all feasible precautions must be taken to avoid all acts likely to destroy or damage them.⁷⁹

70 N. Sadeleer, ‘The Principles of Prevention and Precaution in International Law: Two Heads of the Same Coin?’, in M. Fitzmaurice, D.M. Ong and P. Merkouris (eds), *Research Handbook on International Environmental Law* (2010) 182–199, at 187.

71 D. Bodansky, J. Brunnée and E. Hey, ‘International Environmental Law: Mapping the Field’, in D. Bodansky, J. Brunnée and E. Hey (eds), *The Oxford Handbook of International Environmental Law* (Oxford University Press, 2008) 1–28, at 14.

72 See *Responsibilities and Obligations of States Sponsoring Persons and Entities With Respect to Activities in the Area (Advisory Opinion)*, International Tribunal for the Law of the Sea, 1 February 2011, ITLOS Reports (2011) 10 § 135; and Stefanik, *supra* note 65, at 112.

73 See Art. 2(5) UNECE Water Convention; and Art. 2(4), Convention on Cooperation for the Protection and Sustainable Use of the Danube River, 29 June 1994, 1997 OJ (L342) 19 (‘Danube River Protection Convention’).

74 2014 Jacobsson Report, *supra* note 45, *supra* note 45, § 139.

75 See Art. 51 AP I; and Henckaerts and Doswald-Beck, *supra* note 10, Rules 15–21.

76 See Henckaerts and Doswald-Beck, *supra* note 10, Rule 44; and ICRC Guidelines, *supra* note 62, Rule 8. Although these Rules refer to the natural environment, they could also play a role in relation to transboundary freshwaters.

77 ICRC Guidelines, *supra* note 62, at 44.

78 2014 Jacobsson Report, *supra* note 45, § 137.

79 See Tignino and Irmakkesen, *supra* note 40, at 36–40, Principle 10.

Though different states have expressed their interpretation of what ‘feasible precaution’ or ‘particular care’ or ‘special care’ means, as noted by Marie G. Jacobsson, there is no precise meaning for it under AP I and it ‘has to be applied in a context of other legal rules’.⁸⁰ Besides, the effects of military operations on transboundary freshwater resources are often more complex to assess, raising questions about how onerous the burden of feasible precautions should be.⁸¹ It is argued that the principle does not necessarily require conducting an EIA at the moment of deciding upon the attack though the inclusion of relevant factors into military manuals and directives could conceivably contribute to ensuring better respect for taking all feasible precautions.⁸²

Accordingly, IEL precautionary principle provides more substantive content and guidance (under IHL, there is little guidance as to the content of the duty).⁸³ In a manner that strengthened this view, the ICRC underscored that ‘as the potential effect on the environment will need to be assessed during the planning of an attack, the fact that there is bound to be some uncertainty as to its full impact on the environment means that the “precautionary principle” from international environmental law is of particular relevance to such an attack’.⁸⁴ In addition, while in IHL, the benefit of the doubt is often given to the military actor, under IEL, the burden is shifted to the actor, i.e., where the threat of harm and scientific uncertainty triggered the precautionary principle, the maxim should be ‘harmful until proven harmless’.⁸⁵ Moreover, feasible precaution could mean what is practicable or practically possible, considering all circumstances ruling at the time. IHL does not set a yardstick by which to gauge whether the duty has been fulfilled, and this leaves it open for military commanders to decide the requirements for fulfilling this duty, and here is where IEL precautionary principle can and should be used to interpret IHL. For instance, it would bring the obligation to collect and gather environmental information on the status of transboundary waters into the principle of precaution.⁸⁶ Thus, in relation to the protection of transboundary waters and related installations, intelligence should be gathered on the conditions and civilian uses of the installations which are expected to be affected by the attack, the possible incidental harm, including the reverberating effects, the dependency of the civilian population and the nature of the area where the target is situated (for example village, city, the freshwater resources surrounding the target).⁸⁷

80 *Second Report on the Protection of the Environment in Relation to Armed Conflicts*, by Marie G. Jacobsson, *Special Rapporteur*, UN Doc. A/CN.4/685, 28 May 2015, § 155.

81 See C. Droegge and M.L. Tougas, ‘The Protection of the Natural Environment in Armed Conflict: Existing Rules and Need for Further Legal Protection’, 82 *Nordic Journal of International Law* (2013) 21–51, at 35.

82 *Ibid.*

83 Stefanik, *supra* note 65, at 115.

84 ICRC Guidelines, *supra* note 62, at 124.

85 See Stefanik, *supra* note 65, at 111, 114–115.

86 *Third Report on the Protection of the Environment in Relation to Armed Conflicts*, by Marie G. Jacobsson, *Special Rapporteur*, UN Doc. A/CN.4/700, 3 June 2016 (‘2016 Jacobsson Report’), § 142.

87 See Tignino and Irmakkesen, *supra* note 40, at 39.

B. The IEL Principle of Proportionality

Under IEL, and arguably in freshwater law, proportionality arises as a component of precaution ‘when considering the course of action for addressing the threat of harm that has arisen’ and in that sense, it is similar to proportionality under IHL — as both serve to ‘adjust the means to the objective’ and demand that ‘a course of action is chosen that corresponds to the size of the risk involved’.⁸⁸ The principle of proportionality under IHL aims at ‘establishing an equitable balance between humanitarian requirements and the sad necessities of war’ and assumes a ‘subsidiary role in Article 51 (Protection of the civilian population) as a type of indiscriminate attack, and in Article 57 in the context of precautionary measures’.⁸⁹ It is prevalently accepted that the obligation under IHL requires taking into account not only the direct effects of an attack (e.g. deaths, injuries or damage to civilian objects) but also all reasonably foreseeable incidental harm — reverberating effects (also known as the indirect consequences).⁹⁰ Nevertheless, the overall objective sought by these two principles is different, i.e., under IEL, actors are seeking to balance the desired action with environmental protection of freshwater resources, while under IHL, the objective is to balance ‘military necessity and humanity with the benefit of the doubt generally given to military actors’.⁹¹

Water resources and related installations, being civilian objects in character, are protected against direct attacks and against incidental damage that is excessive (including in combination with other incidental civilian harm).⁹² The question then is how proportionality considerations under IHL should incorporate the protection of transboundary water resources and their installations. ICRC accepted that the proportionality principle applies to incidental damage to the natural environment, which includes transboundary water resources.⁹³ Likewise, the ILC Draft Principles on the protection of the environment in relation to armed conflict provides that ‘environmental considerations shall be taken into account when *applying* the principle of proportionality and the rules on military necessity’.⁹⁴ Furthermore, in its Advisory Opinion on the *Legality of the Threat or Use of Nuclear Weapons*, the International Court of Justice (ICJ) stated that ‘states *must take environmental considerations* into account when assessing what is . . . proportionate in the pursuit of legitimate

88 See Stefanik, *supra* note 65, at 113–114.

89 See Y. Sandoz, S. Christophe and B. Zimmermann (eds), *Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949* (1987), at 2219 and 2207.

90 M. Talhami and M. Zeitoun, ‘The Impact of Attacks on Urban Services II: Reverberating Effects of Damage to Water and Wastewater Systems on Infectious Disease’, 102 *IRRC* (2020) 1293–1325, at 1297–1298.

91 Stefanik, *supra* note 65, at 114.

92 See Arts 48, 51 (5) (b) and 52 (2) AP I; and Henckaerts and Doswald-Beck, *supra* note 10, Rules 7, 10 and 14. See also E.C. Gillard, *Proportionality in the Conduct of Hostilities: The Incidental Harm Side of the Assessment* (2018), at 41–42.

93 See ICRC Guidelines, *supra* note 62, Rule 7 and its commentary.

94 *Report of the International Law Commission: Seventy-First Session (29 April–7 June and 8 July–9 August 2019)*, UN Doc. A/74/10, Principle 15. The full text of the draft principles is reported at § 70 (‘Draft Principles on protection of the environment in relation to armed conflict’).

military objectives. Respect for the environment is one of the elements that go to *assessing* whether an action is in conformity with . . . proportionality'.⁹⁵

In relation to freshwater law, there are specific instruments addressing the proportionality issue. Examples are two documents of the International Law Association (ILA), namely the 'Revision of the Helsinki and other ILA Rules on International Water Resources' adopted in Berlin in 2004 (hereinafter 'Berlin Rules') and the resolution on the 'Protection of water resources and water installations in times of armed conflict' adopted in Madrid in 1976 (hereinafter 'Madrid Rules').⁹⁶ Both documents refer to the proportionality principle. Of note, the ILA is well known for its work on the identification of customary international law relating to freshwater resources. Most of the Rules identified by the ILA 'are firmly based in generally recognized customary international law'.⁹⁷ Working for nearly 50 years, the ILA has adopted a series of instruments addressing various topics relating to freshwater law.

While the Madrid Rules provide that 'the diversion of waters for military purposes should be prohibited when it would cause disproportionate suffering to the civilian population',⁹⁸ the Berlin Rules use stronger language stating that 'combatants shall not, for military purposes or as reprisals, destroy or divert waters, or destroy water installations, if such actions would cause disproportionate suffering to civilians'.⁹⁹ In its commentary, the ILA indicates that the proportionality limitation on the destruction or diversion of freshwater resources and installations is derived from the 'general rule of proportionality in armed conflict'.¹⁰⁰ AP I does not contain a specific rule on the proportionality regarding water resources. Also, there is no rule providing an absolute prohibition against a legitimate method of warfare solely on the basis of collateral damage unless the latter becomes disproportionate. For example, the diversion of a watercourse to allow the movement of troops cannot be considered contrary to the law unless it causes excessive harm or damage to civilians or civilian objects in relation to the concrete and direct military advantage anticipated. The ILA points out that a diverted river or the destruction of a water installation would cause disproportional suffering and damage to the civilian population and must not be considered as a legitimate method of warfare.

This is particularly relevant when considering the potential humanitarian and environmental consequences of damages to water resources and installations, which can have an impact on access to drinking water, health, food

95 *Legality of the Threat or Use of Nuclear Weapons*, International Court of Justice, 8 July 1996, ICJ Reports (1996) 226 ('*Nuclear Weapons Advisory Opinion*'), § 30 (emphasis added).

96 International Law Association, *Water Resources Law, Report of the Seventy-first Conference (16–21 August)*, (2004) ('Berlin Rules'); and International Law Association, *Resolution on the Protection of Water Resources and Water Installations in Times of Armed Conflict, Report of the Fifty-seventh Conference (30 August–4 September 1976)*, (1976) ('Madrid Rules').

97 *Ibid.*, Berlin Rules, at 4.

98 Art. III Madrid Rules, *supra* note 96.

99 Art. 51(1) Berlin Rules, *supra* note 96.

100 *Ibid.*, at 43.

production as well as the interruption of power supply, which can lead to the disruption of water distribution and wastewater treatment, often resulting in indiscriminate effects.¹⁰¹ Thus, the proportionality assessment under IHL, which involves a very complex calculation process, needs to seriously consider the humanitarian (e.g. displacement, starvation, an outbreak of diseases) and environmental consequences of damages to freshwater resources and related installations. For example, diverting the flow of a watercourse to damage or destroy the subsistence of the civil population, terrorize the population or affect the ecology of the enemy would cause disproportional suffering and damage. The gravity of such consequences might serve as a useful interpretative standard regarding the level of emphasis that freshwater resources and related installations shall receive in determining proportionality.

Moreover, the proportionality test is not concerned with the actual outcome of the attack, but of what is the expected collateral damage *vis-à-vis* the anticipated military advantage at the time the decision was made by the military commanders. This necessitates making information on the possible incidental harm available at their disposal, including the reverberating effects linked to the diversion of water or the destruction or damage to water installations.

C. The IEL Principles of Sustainability and Intergenerational Equity

In freshwater law, sustainability can be defined as the duty to consider ‘social, economic and environmental factors and incorporating a multi-generational standard of care to address current needs, while enhancing the ability of future generations to meet their needs’.¹⁰² Sustainability has been a key priority of the international community, as evidenced by the 2030 Agenda for Sustainable Development by the UN in 2015, which *inter alia* recognizes the importance of realizing the sustainable use of water resources (Goal 6). The sustainability principle, interpreted in line with the concept of sustainable development, also pervades the UNECE Water Convention and the UN Watercourses Convention.¹⁰³ The principle of sustainability helps to balance

101 See Tignino and Irmakkesen, *supra* note 40, at 30–36; and Gillard, *supra* note 92, at 169.

102 Art. 2(4)(m), Agreement Between Canada and the United States of America on Great Lakes Water Quality (‘Great Lakes Water Quality Protocol of 2012’), 7 September 2012, available online at https://www.ijc.org/sites/default/files/2018-07/GLWQA_2012.pdf.

103 See Arts 1(1), 2(2), 2(5)(c) and 3(1)(i) UNECE Water Convention; Arts 5, 20, and 24 UN Watercourses Convention. See also *Gabčíkovo-Nagymaros case*, *supra* note 47, § 140; and an array of binding and non-binding instruments also include the principle of sustainability — Stockholm Declaration, *supra* note 42; Rio Declaration, *supra* note 43; *Report of the World Summit on Sustainable Development*, UN Doc. A/CONF.199/20 (2002); International Law Association, *New Delhi Declaration of Principles of International Law Relating to Sustainable Development*, (The Seventeenth Conference of the International Law Association 2–6 April 2002), (2002); *Report of the United Nations Conference on Sustainable Development*, UN Doc. A/CONF.216/16 (2012); and International Union for Conservation of Nature (IUCN) Environmental Law Programme, *Draft International Covenant on Environment and Development — Implementing Sustainability* (2015).

the environmental, social and economic interests in the use and management of transboundary waters. Moreover, it guides states to consider the rights of present and future generations in accordance with the principle of intra- and inter-generational equity.

Intergenerational equity is a vital and 'strongly established' principle of contemporary environmental law.¹⁰⁴ This principle has been stated in global freshwater agreements. For instance, the UNECE Water Convention provides that: 'water resources shall be managed so that the needs of the present generation are met without compromising the ability of future generations to meet their own needs.'¹⁰⁵ Correspondingly, the UN Watercourses Convention aims to 'ensure the utilisation, development, conservation, management and protection of international watercourses and the promotion of the optimal and sustainable utilisation thereof for present and future generations'.¹⁰⁶ Some agreements at the basin level also incorporate this principle. For example, Article 7 of the 2002 Inco-Maputo Agreement states that the parties have a right within their respective territories to the 'optimal and sustainable utilisation of and benefits from water resources of the Incomati and Maputo watercourses', but the obligation to take into account, 'the interests of the other Parties concerned, consistent with adequate protection of the watercourse for the benefit of present and future generations'. The principles of sustainability and intergenerational equity form an important value and concern of the international community.¹⁰⁷

Intergenerational equity aims to balance the needs of present and future generations and ensure our planet's sustainability. Stefanik observes that 'actors must consider both short- and long-term consequences of their actions within the context of protection of both natural and cultural environments . . . We, the current generation, must examine our actions in light of their immediate effects as well as how these actions will affect these resources over time and spanning generations'.¹⁰⁸ The intergenerational equity addresses the significance of considering the long-term effects of measures, arguably during armed conflicts, to better protect and preserve freshwater resources and 'for other aspects of our well-being, such as health, education, and development'.¹⁰⁹ The contamination and the scarcity of water resources in areas affected by armed conflicts have an impact on the well-being and the health of the population and put in danger the rights of present and future generations and the concept of sustainability as a whole.

104 See Stefanik, *supra* note 65, at 106; see further 2014 Jacobsson Report, *supra* note 45, §§ 125–132.

105 Art. 2(5)(c) UNECE Water Convention.

106 See Preamble and Art. 5 UN Watercourses Convention.

107 S. Jodoin and Y. Saito, 'Crimes against Future Generations: Harnessing the Potential of Individual Criminal Accountability for Global Sustainability', 7 *McGill International Journal of Sustainable Development Law and Policy* (2011) 115–156, at 132.

108 Stefanik, *supra* note 65, at 104.

109 *Ibid.*, at 106.

The principles of sustainability and intergenerational equity act as overarching objectives in managing and protecting freshwater resources. These concepts could guide the interpretation and application of IHL and ensure that ‘decisions made in the heat of battle do not inhibit long-term goals of sustainable peace and reconstruction, the effects of which matter intensely not only in the present but for future generations’.¹¹⁰ Nevertheless, it has to be admitted that both principles remain very general (not specifically a ‘rule of international law’), and this might negatively impact their contribution as a tool to interpret the rules and principles of IHL.

D. The Prohibition not to Cause Widespread, Long-term and Severe Damage to the Environment

In addition to protections under general principles of IHL, there are some objects, installations and areas specifically protected during the conduct of hostilities. Among them are the objects indispensable to the survival of the civilian population which include water supplies, installations containing dangerous forces such as dams and dykes, and the natural environment. Freshwater law refers to these obligations of IHL through Article 29 of the UN Watercourses Convention.

Transboundary water resources are protected under the prohibition against causing widespread, long-term and severe damage to the natural environment. AP I considers the protection of the natural environment in its Articles 35(3) and 55.¹¹¹ The adjectives ‘widespread, long-term and severe’ used in these provisions are not defined in the Protocol. In its Guidelines on the Protection of the Natural Environment in Armed Conflict, the ICRC has noted that ‘in assessing the degree to which damage is widespread, long-term and severe, contemporary (i.e. current) knowledge about the effects of harm on the natural environment must be taken into account’.¹¹² The ICRC has also underlined the linkages between the different parts of the environment and the environmental processes. An example is the devastation of the marshlands in Southern Iraq due to drainage and damming works, which caused desertification and loss of biodiversity.

So far, international practice is very limited in relation to the definition of the threshold of widespread, long-term, and severe damage to the environment.¹¹³ It should be highlighted that contamination of water resources has

110 *Ibid.*

111 The concept of environment to which such protection should extend includes ‘fauna, flora, and other biological as well as climactic elements’, see Sandoz, Christophe and Zimmermann, *supra* note 89, at 2126.

112 ICRC Guidelines, *supra* note 62, at 54.

113 In 2000, the Report to the Prosecutor of the International Criminal Tribunal for the former Yugoslavia (ICTY) assessed, inter alia, the damages caused to the environment, including in the Danube and Sava transboundary watercourses, by the NATO bombing campaign over Yugoslavia. This report finds that the damages caused by the air campaign do not meet the triple cumulative threshold established by Art. 35, namely of being ‘widespread, long-term

serious social and economic consequences in the medium to long term. Moreover, as one author observed, 'what would be considered as excessive environmental damage is not clear, and it is not static over time. What was considered as acceptable collateral damage decades or even years ago, that is, proportionate to the military advantage pursued, might not be regarded as acceptable today'.¹¹⁴ In the context of freshwater resources, this statement is particularly true. Nowadays, the water crisis emphasizes the vital importance and vulnerability of freshwater resources, especially in armed conflict. While freshwater and the rest of the environment may suffer from economic activity in times of peace, the problem is far worse in times of war, when contamination may be deliberate rather than accidental.

The threat of harm to the environment (serious or irreversible damage) is without doubt one of the key elements of the precautionary principle. Since all interactions with the environment produce some sort of effect or potential change on the environment, it is important to distinguish between acceptable and unacceptable environmental change. The threshold of 'not causing significant harm' is the accepted standard under freshwater law. The UN Watercourses Convention stipulates that in utilizing an international watercourse in their territories, watercourse states 'take all appropriate measures to prevent causing of significant harm to other watercourse States'.¹¹⁵ The UNECE Water Convention used the concept of 'transboundary impact' to denote 'any significant adverse effect on the environment resulting from a change in the conditions of transboundary waters'.¹¹⁶ According to the ICJ, there is an obligation to avoid activities that could cause significant damage to the environment and this obligation forms 'part of the corpus of international law relating to the environment'.¹¹⁷ Moreover, the Madrid Rules refer 'to grave dangers to the civilian population or substantial damage to the ecological balance' as a threshold for the protection of freshwater resources during armed conflicts.¹¹⁸ The Berlin Rules suggest that it is prohibited to destroy or divert waters or to destroy water installations 'when such acts would cause widespread, long-term, and severe ecological damage prejudicial to the health

and severe'. The ICTY Prosecutor had to deal with a number of communications requesting her to institute criminal proceeding against those responsible for the bombing campaign of NATO between March and June 1999. The Prosecutor established an expert commission to evaluate both the law and the facts in this respect. See ICTY Press Release, 'Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia', available online at <https://www.icty.org/x/file/Press/nato061300.pdf>.

114 R. Desgagné, 'The Prevention of Environmental Damage in Time of Armed Conflict: Proportionality and Precautionary Measures', 3 *Yearbook of International Humanitarian Law* (2000) 109–129, at 116.

115 Art. 7 UN Watercourses Convention.

116 Art. 1(2) UNECE Water Convention.

117 See *Pulp Mills case*, *supra* note 48, § 101; and *Nuclear Weapons Advisory Opinion*, *supra* note 95, § 29.

118 Art. IV Madrid Rules, *supra* note 96.

or survival of the population or if such acts would fundamentally impair the ecological integrity of waters'.¹¹⁹

Under IHL, different wording is adopted in the provisions aimed at protecting the environment. For instance, AP I prohibits 'widespread, long-term and severe' harm,¹²⁰ where the 'the inference is that the larger the area affected and the more long-term or persistent the harm, the more serious the harm'.¹²¹ The Convention on the prohibition of military or any other hostile use of environmental modification techniques (ENMOD), which covers the hydrosphere, adopted instead a *disjunctive* standard of 'widespread, long-lasting or severe' harm.¹²² Other IHL provisions prohibit 'extensive', 'unnecessary' or 'wanton' destruction of property.¹²³ It is argued that these limitations do not 'affect other obligations relevant for the protection of the natural environment in the conduct of hostilities',¹²⁴ including from freshwater law.

Accordingly, this article adopts the 'significant harm/damage' standard recognized under the freshwater law and IEL.¹²⁵ Although this standard is not binding as such in the context of armed conflicts, it 'will serve as a benchmark against which the sufficiency of wartime environmental protection can be evaluated', it helps to avoid arbitrariness and it 'provides a real test of the adequacy of the wartime protections'.¹²⁶ Employing such a standard as a benchmark to measure acceptable wartime harm will help those planning and executing military operations to assess and define the limits within which they have to operate. In fact, if 'environmental damage' to freshwater resources is excessive in relation to the military advantage anticipated, then it constitutes a violation of the proportionality rule under IHL. The IEL standard excludes the use of methods or means of warfare that are intended, or may be expected, to cause significant harm to freshwater resources. In addition, this standard should remain applicable for potential transboundary impact. Hence, parties to a conflict will want to adhere to this standard to avoid incurring international responsibility. The 'significant harm' standard will also protect states which share an international watercourse but are not parties to an armed conflict. The applicability of this IEL standard in NIACs raises fewer questions, as Additional Protocol II ('AP II') did not include a provision on the protection of the environment — even though, according to the ICRC, the customary law prohibition of the 'widespread, long-term and severe' damage to

119 Art. 52 Berlin Rules, *supra* note 96.

120 Arts 35(3) and 55(1) AP I.

121 Stefanik, *supra* note 65, at 109.

122 Art. 1, Convention on the prohibition of military or any hostile use of environmental modification techniques, 10 December 1976, 1108 UNTS 151 (emphasis added).

123 K. Hulme, *War Torn Environment: Interpreting the Legal Threshold* (Martinus Nijhoff, 2004), at 142.

124 D. Fleck, 'Legal Protection of the Environment: The Double Challenge of Non-International Armed Conflict and Post-Conflict Peacebuilding', in Stahn, Iverson and Easterday (eds), *supra* note 65, 203–219, at 209–218.

125 For the definition of the concept, see A. Rieu-Clarke, R. Moynihan and B.O. Magsig, *UN Watercourses Convention: User's Guide* (2012), Commentary to Art. 7, at 120.

126 See Hulme, *supra* note 123, at 139–144; see also Droegge and Tougas, *supra* note 81.

the natural environment is *arguably* applicable in NIACs.¹²⁷ Given the rejection of a proposal to include a similar provision under AP II, the limited geographical scope of NIACs, and the recent recognition of the human right to a clean, healthy and sustainable environment, whether the high threshold under IAC is 'necessarily appropriate' for NIACs is subject to debate.¹²⁸ However, it would be logical to assume that neither a state nor an ANSA involved in a NIAC would have an interest or benefit from causing widespread, long-term and severe damage to the environment. In fact, preventing damage to the environment would help the party involved in the armed conflict to get the people's support and consolidate control over the territory.

4. The Complementary Role of Freshwater Law with Respect to IHL

A. The Applicability of the Relevant IEL Treaties in Armed Conflict

Since the 1990s, the number of international water agreements that concern the protection of riverine ecosystems and water quality has remarkably increased. IEL instruments providing protection for freshwater resources and related installations under international law keep on applying during hostilities, independently of IHL, except when their applicability is excluded in the instrument itself or the nature of the treaty. These instruments remedy deficiencies or uncertainties that hinder the effective protection of transboundary freshwaters in times of armed conflict. Moreover, principles of IEL, such as prevention and precaution, should be taken into account during armed conflict. In fact, in the work of the ILC on the Protection of the environment in relation to armed conflicts, IEL principles — prevention and precaution — were discussed as 'candidates for continuing application during armed conflict'.¹²⁹ In line with this, members of ILC highlighted the need to 'methodically examine rules and principles of international environmental law to consider their continued applicability during armed conflict and their relationship with that legal regime'.¹³⁰ With the view to ensuring the coherence of principles and rules of international law and unity of the international legal system,¹³¹ such international rules must be considered in situations of armed conflict, though determining the extent to which they apply in parallel to IHL is a complex issue.¹³² This is also true not only for states but also for ANSAs that exercise quasi-state functions.

127 ICRC Guidelines, *supra* note 62, Rule 2, at 29; see also, Draft Principles on protection of the environment in relation to armed conflict, *supra* note 94, Commentary to Principle 13, § 7.

128 Droege and Tougas, *supra* note 81, at 43.

129 2014 Jacobsson Report, *supra* note 45, § 117.

130 *Report of the International Law Commission to the United Nations General Assembly*, UN Doc. A/70/10, 14 August 2015, § 142.

131 J. Raz, 'Legal Principles and the Limits of Law', 81 *The Yale Law Journal* (1972) 823–854, at 840.

132 ICRC Guidelines, *supra* note 62, at 30.

1. General Applicability

Articles 29 of the UN Watercourses Convention obliges Member States to use and protect the watercourses in line with the Convention, including during armed conflicts, and if the watercourse and/or its facilities are affected by the armed conflict, IHL rules and principles will also apply. The ILC Draft Articles and the Revised Protocol on Shared Watercourses of the Southern Africa Development Community ('SADC') also contain rules similar to those of the UN Watercourses Convention on the applicability of IHL.¹³³ Article 29 affirms that international watercourses and related installations are protected under IHL and shall not be used in violation of the principles and rules of IHL. Thus, the Convention continues to apply unless a *lex specialis* IHL rule explicitly or implicitly excludes its applicability. Depending on the context, freshwater law rules relevant to the protection of transboundary waters and related installations complement IHL in times of armed conflict.¹³⁴ Based on this interaction, the observations made by the ICRC in the context of the relationship between IEL and IHL are equally applicable to the interaction between freshwater law and IHL. Such interaction can generally be 'highly context specific',¹³⁵ and the interplay thereof must be considered on a rule-by-rule basis.¹³⁶ Of course, the humanitarian objectives and concerns related to protecting transboundary freshwater resources are not mutually exclusive.

In addition, Article 30 of the Convention addresses exceptional cases in which direct contact between the concerned watercourse states cannot be established (which is common when states are involved in armed conflicts) and obliges concerned states to continue fulfilling their obligations and cooperate on issues such as the exchange of data and information, notification, consultations and negotiations. This communication channel (indirect contact) plays a vital role in effectively regulating transboundary freshwater resources and related installations and promptly preventing and responding to damages or danger arising from armed conflicts. For example, IHL does not contain provisions regarding the notification of emergencies on international watercourses or the establishment of warning systems between states sharing transboundary waters. Special Rapporteur Schwebel introduced these obligations in 1982 under Article 13(5) of the Draft articles on the law of the non-navigational uses of international watercourses. The draft Article states that:

Without prejudice to the question of the effect otherwise of the outbreak of hostilities upon the status of any system agreements or other water-related treaties or arrangements, system States shall, to the extent possible, by direct or indirect means, sustain during times of

133 2008 ILC Report, *supra* note 13, Art. 18, at 77–78; and Art. 4(3)(c)(iii), Revised Protocol on Shared Watercourses of the Southern Africa Development Community (SADC), 7 August 2000, available online at <https://www.internationalwaterlaw.org/documents/regionaldocs/Revised-SADC-SharedWatercourse-Protocol-2000.pdf>.

134 See UNEP, *Protecting the Environment*, *supra* note 68, at 5; and Stefanik, *supra* note 65, at 100–101.

135 ICRC Guidelines, *supra* note 62, at 35.

136 *Ibid.*, at 33.

armed conflict warning systems established with other system States for the purpose of informing a system State or States of the threat or occurrence of a water-related hazardous event.¹³⁷

This provision aims to avert hazardous events in neighbouring riparian states, thereby contributing to save the life of the population. It notes that 'direct or indirect means' of cooperation to prevent water-related hazards should include the transmission of warnings to a watercourse state that may be affected by the contamination of water resources or by damage to a water facility during armed conflicts. Joint institutional mechanisms on transboundary water resources have played a crucial role in ensuring 'indirect cooperation' between watercourse states, even during armed conflicts. As will be discussed later, there are several examples where states continued to cooperate over water using 'indirect procedures' while at war.

The need to have information on the watercourses should be balanced against the interest of riparian states to retain confidentiality in sensitive issues. In this regard, Article 31 of the UN Watercourses Convention creates a very narrow exception to the requirements to provide information under the procedures governing the exchange of information, notification and consultation under the Convention. The legal effect of this provision is that states are not required to release information concerning a watercourse which is 'vital to their national defence or security'. The notion of 'vital information to national defence or security' is not defined by the Convention but refers mainly to strategic or military types of information.¹³⁸ However, even in these cases, Article 31 requires a state withholding information to 'cooperate in good faith with the other watercourse States to provide as much information as possible under the circumstances'. It is important to emphasize that the ILC intended the cooperation in good faith to be the guiding principle of Article 31.¹³⁹

In contrast to the UN Watercourses Convention, the UNECE Water Convention does not contain any provisions in relation to armed conflicts. However, one can argue that it continues to apply during armed conflicts.¹⁴⁰ For example, in the current conflict between Ukraine and Russia, the two countries both parties to this Convention have not raised any objections regarding its continued application. Besides, the UNECE Water Convention and the 1998 Aarhus Convention include procedural obligations relevant to

137 *Third Report on the Law of the Non-Navigational Uses of International Watercourses*, Stephen M. Schwebel, *Special Rapporteur*, UN Doc. A/CN.4/348, 11 December 1981, at 169.

138 1994 ILC Report, *supra* note 28, at 112.

139 See Rieu-Clarke, Moynihan and Magsig, *supra* note 125, at 224.

140 See *Report of the International Law Commission Sixty-third session* (26 April–3 June and 4 July–12 August 2011), UN Doc. A/66/10. The full text of the draft articles the effects of armed conflicts on treaties with commentaries thereto is reported under § 101. Under Art. 7, the indicative list of treaties that continue in operation, in whole or in part, during armed conflict, include treaties relating to the international protection of the environment and international watercourses and related installations and facilities.

the protection of freshwater and related installations.¹⁴¹ The obligation to exchange information under Article 13 of the UNECE Water Convention may be subject to ‘protection of information’ limitations. Article 8 allows parties to limit the exchange of information ‘in accordance with their national legal systems and applicable supranational regulations to protect information related to industrial and commercial secrecy, including intellectual property, or national security’. The Guide of Implementation to the UNECE Water Convention notes that parties should apply Article 8 restrictively concerning requests for information from other parties, especially when these concerns data relating to discharges into transboundary waters.¹⁴²

The UNECE Water Convention requires ecologically rational management of waters and addresses the conservation and restoration of damaged ecosystems. Joint commissions have been established by agreements on freshwater resources to deal with the sources and nature of pollution and to put in place measures to fight against contamination.¹⁴³ Furthermore, organizations such as UNECE and the Council of Europe have promoted measures against pollution since the 1960s.¹⁴⁴ Various international instruments relevant to the protection of freshwater set standards and provide procedures and mechanisms of enforcement that could provide opportunities to complement the existing IHL protections.¹⁴⁵ Such gap-filling role of IEL principles in shaping the protection of freshwater resources during armed conflicts is also recognized by several scholars.¹⁴⁶

2. The Territorial Scope of Transboundary Freshwater Agreements

Freshwater agreements deal with concerns that transcend state borders and are relevant to address not only the impact of activities conducted by a state party in the part of a watercourse crossing its own territory but also the activities of another riparian state which may affect the same international watercourse. Watercourses are not just partitioned between states but form a

141 Art. 4, Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, 25 June 1998, 2161 UNTS 447, (‘Aarhus Convention’).

142 United Nations Economic Commission for Europe (UNECE), *Guide to Implementing the Water Convention* (2013), at 82–84 available online at <https://unece.org/environment-policy/publications/guide-implementing-water-convention>.

143 See Great Lakes Water Quality Protocol of 2012, *supra* note 102; Agreement on the protection of the River Meuse, 26 April 1994, available online at <http://extwprlegs1.fao.org/docs/pdf/mul15767.pdf>; and Danube River Protection Convention, *supra* note 73 — just to name a few of the numerous examples.

144 See Food and Agriculture Organization of the United Nations (FAO), *The Law of International Water Resources* (1980), at 144, 210–213.

145 M. Bothe et al., ‘International Law Protecting the Environment during Armed Conflict: Gaps and Opportunities’, 92 *IRRC* (2010) 569–592, at 570.

146 See *ibid.*; Stefanik, *supra* note 65; C. Bruch, C. Payne and B. Sjöstedt, ‘Armed Conflict and the Environment’, in L. Rajamani and J. Peel (eds), *The Oxford Handbook of International Environmental Law 2* (2021) 865–882.

shared common resource based on a ‘community of interest’ of riparian states.¹⁴⁷ The ‘community of interest’ approach transcends the national borders and builds a collective interest in protecting freshwater, including riparian and non-riparian states.¹⁴⁸ The notion of a ‘drainage basin’ provides the basis for enlarging the territorial scope of state obligations in freshwater agreements. For example, the 1966 Helsinki Rules use the term ‘international drainage basin’ to mean a ‘geographical area extending over two or more states determined by the watershed limits of the system of waters, including surface and underground waters, flowing into a common terminus’.¹⁴⁹ While the UN Watercourses Convention refers to international watercourses suggesting a narrower approach, this instrument also applies to ecosystems which can expand its scope of application beyond the territory of a state.¹⁵⁰ Moreover, some recent treaties do not use the concept of ‘watercourse’ but they opted for a far-reaching terminology. An example of such a treaty is the 2019 Water Charter of the Volta River Basin that applies ‘to the Volta River and to all surface and groundwater resources and associated ecosystems found within the geographical limits of its catchment area’.¹⁵¹ This treaty shows that transboundary freshwater agreements not only apply to the watercourse understood narrowly but also to the entirety of the watercourse ‘environment’ or ‘ecosystem’ which often goes beyond the territory of a state.

In addition, some specific provisions of freshwater agreements may impose duties on non-riparian states to international watercourse. Unlike other provisions of the UN Watercourses Convention, its Article 29 on international watercourses and installations in times of armed conflict is addressed to *all states*, not just watercourses states. This is justified given that international watercourses and related installations may be used or attacked in times of armed conflict not only by watercourses states but also by other states. While this provision *per se* would not bind a state not a party to the UN Watercourses, the inclusion of non-watercourse states within its coverage was considered necessary because of the importance of the topic.¹⁵² Similarly, Article 18 of the ILC Draft Articles is not only addressed to aquifer states but also to non-aquifer states that might use or attack aquifers and related installations during armed conflicts.

There are also Multilateral Environmental Agreements (MEAs) that can contribute to protecting freshwater ecosystems, such as the Ramsar Convention on Wetlands. The Convention lacks express provisions on its territorial scope.

147 *Case Relating to the Territorial Jurisdiction of the International Commission of the River Oder*, 1929 PCIJ Series A, No. 23, at 74; *Gabčíkovo-Nagymaros case*, *supra* note 47, § 85; and *Pulp Mills case*, *supra* note 48, § 281.

148 M. Vordermayer, ‘The Extraterritorial Application of Multilateral Environmental Agreements’, 59 *Harvard International Law Journal* (2018) 59–124, at 95–96.

149 International Law Association, *Helsinki Rules on the Use of Waters of International Rivers*, Report of the Fifty-second International Law Association Conference, August 1966, Art. 2.

150 Art. 20 UN Watercourses Convention.

151 Art. 2(1) Water Charter for the Volta River Basin (2019).

152 1994 ILC Report, *supra* note 28, Commentary to Art. 29, at 131.

Article 3(1) of the Ramsar Convention stipulates that states shall ‘formulate and implement their planning so as to promote the conservation of the wetlands included in the List’. The absence of the reference to the clause ‘in their territory’ relating to listed sites may indicate an extraterritorial dimension. This can be interpreted as an indication that states parties are under an obligation to avoid causing harm to the listed sites outside their territories. Support for this can also be found in the Certain Activities in the Border Area/Construction of a Road dispute, which concerned, inter alia, the impacts on two wetlands both surrounding the San Juan River.¹⁵³ Judge ad hoc Dugard, in his separate opinion, endorsed the concept of extraterritorial obligations and indicated that ‘when Nicaragua planned its dredging programme in 2006 and carried out an environmental impact study it was bound to “formulate and implement” its planned environmental assessment study in such a way as to promote the conservation not only of its own wetland, the Refugio de Vida Silvestre Rio San Juan, but also of Costa Rica’s Humedal Caribe Noreste’.¹⁵⁴ It could, thus, be argued that the Ramsar Convention should be interpreted in a manner that listed wetlands should not be impacted by any act or omission of state parties, irrespective of where such wetlands are located.

3. Applicability to Armed Non-State Actors

Neither common Article 3 of the four Geneva Conventions nor AP II do explicitly address the protection of the natural environment for NIACs.¹⁵⁵ Interestingly, the ILC Draft Principles on the protection of the environment in relation to armed conflicts do not differentiate between IACs and NIACs. States involved in NIACs must respect their IEL obligations towards other states.

Unlike some IHL conventions, freshwater instruments, including transboundary water conventions, do not directly address armed groups. However, it is prevalently accepted that ANSAs exercising quasi-governmental functions must respect international obligations of the state (e.g. control of territorial or legislative jurisdiction theories).¹⁵⁶ These include IEL obligations, specifically those regulating freshwater resources, as these are indispensable for the well-being and survival to the civilian population. Specific examples are the duty to ensure the right of everyone under their jurisdiction to an adequate standard of living, including safe drinking water, the right to access a healthy environment, and the right to information and participation, which are increasingly included in freshwater agreements.¹⁵⁷ The case of ISIL taking control of

153 *Certain Activities Carried Out by Nicaragua in the Border Area & Construction of a Road in Costa Rica Along the San Juan River (Nicaragua v. Costa Rica)*, International Court of Justice, 16 December 2015, ICJ Reports (2015) 665, § 58.

154 *Ibid.*, Separate opinion of Judge ad hoc Dugard, § 42.

155 Henckaerts and Doswald-Beck, *supra* note 10, Rule 45.

156 See K. Fortin, *The Accountability of Armed Groups under Human Rights Law* (Oxford University Press, 2017), at 177–208.

157 See e.g. Arts 7, 8 and 16 Water Charter of the Senegal River; Arts 4(k), 7(b), 60 and 73, Water Charter of the Lake Chad Basin, April 2012, available online at <https://iea.uoregon>.

dams on the Tigris and Euphrates rivers shows the importance of such regulations.¹⁵⁸

Furthermore, ANSAs may take unilateral commitments to protect freshwater and related installations.¹⁵⁹ While such commitments taken by ANSAs are not explicit on freshwater agreements, there are few cases where ANSAs adopted regulations on the prohibition of poisoning freshwater and the attacks against dams and dykes. For example, the National Liberation Army (*Ejército de Liberación Nacional*) (ELN), an armed group in Colombia, enacted 'El Código de Guerra' which, among others, mentioned that 'forces shall not target installations more useful to the community than the enemy, and installations containing dangerous forces such as dams or nuclear material shall not be attacked'.¹⁶⁰ Moreover, ELN commits itself not to poisoning water supplies and resources. The National Transitional Council/Free Libyan Army (NTC/FLA), an armed group that operated in Libya, adopted guidelines providing that its forces would not target civilian objects and strive to avoid as far as possible any effect on civilians resulting from their military operations — what should include avoiding targeting works and installations containing dangerous forces.¹⁶¹ Although these regulations are more a restatement of rules of IHL rather than obligations of freshwater law, they may also contribute to the protection of freshwater.

There are still many instances where ANSAs have not taken commitments to avoid damage to freshwater. In Syria, there were widespread reports that ISIL made water unsafe to drink by poisoning or contaminating freshwater resources using crude oil. In 2014, it was revealed that ISIL 'deliberately contaminated drinking water with crude oil in the Balad district of Salahaddin Governorate, south of Tikrit. There were also reports of poisoned water supplies from Aleppo, Deir ez-Zor, Raqqa and Baghdad'.¹⁶² Also, in Somalia, water wells were poisoned by al Shabaab, a militant group affiliated with Al-Qaeda, to prevent government soldiers from drinking the water, killing

edu/treaty-text/8955; and Arts 4(2)(b) and 21, Treaty between the Government of the Republic of Moldova and the Cabinet of Ministers of Ukraine on Cooperation in the Field of Protection and Sustainable Development of the Dniester River Basin, 29 November 2012 ('Dniester River Basin Treaty'), available online at <https://leap.unep.org/sites/default/files/treaty/TRE160050.pdf>.

158 T. Lossow, 'Water as Weapon: IS on the Euphrates and Tigris. The Systematic Instrumentalisation of Water Entails Conflicting IS Objectives', *German Institute for International and Security Affairs* (2016), available online at <http://www.swp-berlin.org/en/publication/water-as-weapon-is-euphrates-tigris>.

159 *Second Report on Protection of the Environment in Relation to Armed Conflicts* by Marja Lehto, *Special Rapporteur*, UN Doc. A/CN.4/728, A/CN.4/728 (2019), at 54 (fn 189 — for examples of commitments on environmental issues).

160 *National Liberation Army (Ejército de Liberación Nacional) (ELN)*, Code of War (Unofficial Translation), available online at http://theirwords.org/media/transfer/doc/ut_co_eln_1995_01_eng-07e5677b22c4cf06bdfc9f02eff206ef.pdf.

161 NTC/FLA, 'Guidelines on the Law of Armed Conflict — Libyan Opposition Forces', available online at http://theirwords.org/media/transfer/doc/ly_ntc_2011_09-344f847e0eb8a2e16e10099309e91005.pdf.

162 Lossow, *supra* note 158, at 2.

more than 30 people.¹⁶³ However, it must be noted that no ANSA has ever claimed that poison may lawfully be used to pollute freshwater in either IAC or NIAC.

B. Potential Conflicts of Specific Rules under IHL and Freshwater Law

Rules of IHL and freshwater law should be taken into consideration during armed conflicts. When both specific rules of IHL and freshwater law apply to a particular issue, it is necessary to examine if the difference amounts to an actual conflict between the two rules in question. In the case of a conflict between the respective rules, a resort could be made to the principle of *lex specialis derogat legi generali*, by which a more specific rule takes precedence over a more general one. As Koskenniemi explained in his report of 2004 to the ILC: '*lex specialis* is a widely accepted maxim of legal interpretation and technique for the resolution of normative conflicts.'¹⁶⁴ However, relying on this principle is not really helpful when two specialized rules such as one of IHL and one of freshwater law stand side by side. On the one hand, it may be argued that a rule under IHL is *lex specialis* as it is developed specifically for the context of armed conflict. On the other hand, it can also be argued that a rule under freshwater law is *lex specialis* as it has much more developed provisions relating to freshwater and related installations. The principle of *lex specialis* does not provide criteria to decide whether one area is generally more special than another, nor to determine a relationship between two special rules.

As discussed earlier, the call for applying rules of both IHL and freshwater law during armed conflicts is reflected in the UN Watercourses Convention, the ILC Draft Articles and the SADC Protocol. IHL instruments, together with the instruments of freshwater law, 'point to the universal acceptance of certain legally binding rules prohibiting hostile activities against or using water resources and installations as a weapon'.¹⁶⁵ Despite this, the application of some specific rules of freshwater agreements might conflict with rules of IHL. When the conflicting IEL norm is formulated in a sufficiently open way, the principle of systemic integration — finding its most common formulation in Article 31(3)(c) of the 1969 Vienna Convention on the Law of Treaties — becomes relevant. For instance, Article 2(1) of UNECE Water Convention enunciates that 'Parties shall take all appropriate measures to prevent, control and reduce any transboundary impact'. In such cases, the standard of '*all appropriate measures*' should be informed by IHL.

163 See I. Futehally, *Blue Peace Bulletin — Water And Violence: Somalia*, Strategic Foresight Group (2019), available online at <https://policycommons.net/artifacts/1795325/blue-peace-bulletin-water-and-violence/2527001/>.

164 *Study on the Function and Scope of the Lex Specialis Rule and the Question of 'self-Contained Regimes': Preliminary Report by Martti Koskenniemi, Chairman of the Study Group on Fragmentation of International Law*, A/CN.4/JILC(LVI)/SG/FIL/CRD.1, 7 May 2004, at 21.

165 P. Wouters, S. Vinogradov and B.O. Magsig, 'Water Security, Hydrosolidarity, and International Law: A River Runs Through It ...', 19 *Yearbook of International Environmental Law* (2008) 97–134, at 126.

However, when the IEL norm is not open-textured, the *lex specialis* principle should be applied to determine which rule prevails over another in a particular situation. This is the case when IHL rules provide different thresholds and do not prohibit causing damage to the environment. For example, Article 7 of the UN Watercourses Convention requires not ‘causing significant harm’ to the environment while the threshold under IHL is ‘widespread, long-term and severe damage to the natural environment’. Likewise, as enshrined under Article 54(5) of AP I, attacking drinking water installations, drying up springs, or diverting rivers could be justified by ‘imperative military necessity’. These conducts are contrary to the ‘vital human needs’ and ecological protections under freshwater agreements.

C. Complementary Regulation

As discussed previously, IEL complements IHL rules in the protection of freshwater and related installations. For example, IHL does not contain provisions regarding the notification of emergencies on international watercourses or the establishment of warning systems between states sharing transboundary freshwaters. This section highlights selected areas where IEL rules and principles governing freshwater and related installations could complement the rules of IHL in relation to the protection of water resources and infrastructure.

1. Some Standard-setting Rules of IEL

Widely accepted international standards and practices and principles of IEL ‘provide necessary nuance to military decision-makers applying existing *jus in bello* protections for civilians and the environment’ and ‘it is critical that IEL principles continue to be at the forefront of decision-makers’ minds in the transition to peace, the *jus post bellum*’.¹⁶⁶ In view of the inherently destructive nature of warfare, Principle 24 of the Rio Declaration provides that ‘states shall ... respect international law providing protection for the environment in time of armed conflict and *cooperate in its further development, as necessary*’.¹⁶⁷ In relation to the protection of the environment in relation to armed conflicts, the ICRC indicated some areas for improvement — ‘the need to better protect certain areas of environmental importance; and the need to find mechanisms and procedures to address the environmental consequences of hostilities’.¹⁶⁸ Developments in the field of the protection of freshwater resources and related installations, e.g., the Madrid Rules and Berlin Rules, addressed issues of rendering water unfit for use, targeting water or water installations, ecological balance, obligations of an occupying power and general rules on cooperation, such as exchange of information, notification and consultation.¹⁶⁹ Notably, the

166 Stefanik, *supra* note 65, at 118.

167 Rio Declaration, *supra* note 43 (emphasis added).

168 Droege and Tougas, *supra* note 81, at 42.

169 See Arts I and VI Madrid Rules, *supra* note 96; and Arts 50–58, Berlin Rules, *supra* note 96.

progress regarding procedural environmental rights such as the right to information, to participate in decision-making and to have access to justice are worth mentioning.¹⁷⁰ The development under different treaties on freshwater resources concerning information sharing and public participation definitely complements IHL as the latter largely lacks such obligations.

The involvement of the public is increasingly recognized as an important aspect of transboundary water management. Participation helps to raise awareness of issues that may affect the public. Participation can also ensure that decision-makers are cognizant of the needs and concerns of those potentially affected by any of their decisions. In turn, this may lead to more responsive decision-making. Additionally, effective public participation can lead to greater acceptance of any decisions made. Participation can also assist the local communities in collectively learning how to manage complex systems, such as transboundary waters.

The Aarhus Convention sets out the three critical pillars of public participation, namely access to information, participation in decision-making and access to justice. Under Article 16, the UNECE Water Convention stipulates that 'riparian Parties shall ensure that information on the conditions of transboundary waters, measures taken or planned to be taken to prevent, control and reduce transboundary impact, and the effectiveness of those measures, is made available to the public'. No similar provision is provided in the UN Watercourses Convention, although it could be argued that public participation is an important means by which states sharing transboundary waters fulfil their commitment under the Convention to take 'all appropriate measures' to prevent significant harm.¹⁷¹ Some freshwater treaties on specific watercourses contain provisions for public participation. For example, the 2012 Dniester Treaty between Ukraine and Moldova stipulates that 'each Contracting Party shall . . . ensure public access to information on the status of the Dniester River Basin and public participation in decision-making related to protection and sustainable development of the Dniester basin, as well as projects likely to have a significant impact on the status of water and other natural resources and ecosystems'.¹⁷²

In relation to access to justice, the UN Watercourses Convention includes a provision that stipulates that any legal or natural person who has suffered harm as a result of activities on an international watercourse or basin thereto will be entitled to seek legal redress for that harm in the state where those activities were carried out.¹⁷³ States sharing transboundary waters cannot discriminate on nationality when natural and legal persons seek compensation or other relief for any significant transboundary harm. However, significant

170 See Rio Declaration, *supra* note 43, Principles 10, 19 and 20–22; Aarhus Convention; For a discussion on such procedural rights and their status under international law, see E. Hey and A. Quintavalla, 'How International Water Law Connects to Environmental Law and Human Rights', in M. Faure (ed.), *Elgar Encyclopedia of Environmental Law* (2021) 190–202.

171 Art. 7 UN Watercourses Convention.

172 Art. 21 Dniester River Basin Treaty.

173 Art. 32 UN Watercourses Convention.

financial, administrative and political barriers may preclude individuals, legal persons or communities in one watercourse state from seeking redress for harm caused by activities in another state.

Moreover, as indicated by the ILC, EIA is recognized both under 'national and international law' and it enables 'states to live up to a standard of due diligence'.¹⁷⁴ The requirement of assessment of adverse effects of activities and provision of mitigation measures has been incorporated in various forms in many international instruments, including the UNECE Water Convention,¹⁷⁵ the UN Watercourses Convention¹⁷⁶ and the UNECE Convention on Environmental Impact Assessment in a Transboundary Context. Other freshwater agreements also include the duty to carry out transboundary impact assessments.¹⁷⁷

Thus, EIAs and lessons learned regarding incidental damage to the natural environment during conflicts, including indirect second and third-order effects, should inform and complement standards of protection of freshwater resources and influence policymakers and military commanders in future military operations. For instance, the comprehensive review of the environmental effects of armed conflicts conducted by the UNEP provided a set of recommendations in relation to EIA.¹⁷⁸ Likewise, there is a need to carry out EIAs prior to engaging in any attack against military objectives that contain substances that may have incidental adverse impacts on transboundary water resources and related installations.

Moreover, civil society organizations could gather environmental data using modern technology that could contribute to preventing or repairing damages to the environment, including freshwater resources.¹⁷⁹ Since IHL requires preventing unnecessary suffering and damage, the availability of scientific data and standard environmental assessment practices would enable to address the uncertainty about the environmental impacts of military operations on freshwater resources.

2. The Notion of 'Protected Zones'

In line with some specifically protected objects and zones under IHL, there has been an increasing call to 'designate certain environmentally important areas as protected zones that are to be avoided by all combatants'.¹⁸⁰ For instance, as suggested by the ICRC, 'to avoid the consequences of hostilities, certain fragile environments or areas of major ecological importance, such as

174 2014 Jacobsson Report, *supra* note 45, §§ 150–153.

175 Arts 3(1)(h) and 9(2)(j) UNECE Water Convention.

176 Art. 12 UN Watercourses Convention.

177 See Art. 9, Agreement on Cooperation for the Protection and Sustainable Use of the Waters of the Spanish-Portuguese Hydrographic Basins, 30 November 1998, available online at http://www.cawater-info.net/bk/water_law/pdf/spain_portugal_en.pdf.

178 See UNEP, *Protecting the Environment*, *supra* note 68, at 43–47.

179 See e.g. 2016 Jacobsson Report, *supra* note 86, § 145.

180 See Bruch, Payne and Sjöstedt, *supra* note 146, at 870.

groundwater aquifers, national parks and habitats of endangered species, should be off-limits to any form of military activity'.¹⁸¹ Correspondingly, the ILC Draft Principles on the Protection of the environment in relation to armed conflicts incorporated provisions on designating 'areas of major environmental and cultural importance' as protected zones.¹⁸² States and parties to armed conflicts should take preventive measures around transboundary water resources and related installations to avert the potential catastrophic humanitarian and environmental consequences the damage to such resources and installations could cause. It has to be mentioned that under Article 54, AP I also urges Member States to conclude further agreements to provide additional protection for objects containing dangerous forces (dams and dykes). Though no sweeping generalization can be made regarding this preventive measure, the importance attached to freshwater and the environment, in general, would necessitate recognizing the value of protected zones.

3. Effective Remedies and Enforcement Mechanisms

Another area where IEL and freshwater law could increasingly influence and complement IHL is in ensuring effective remedies, as reparation issues deserve more attention today in the context of armed conflicts.¹⁸³ Increasing concern for freshwater resources means that 'reparations bodies may apply a much more inclusive standard than IHL' as was the case during the 1990–1991 Gulf War, where Iraq had to pay compensation for environmental damage, including water pollution.¹⁸⁴ Note, however, that in relation to the 1998–2000 armed conflict between Eritrea and Ethiopian, where Ethiopia submitted a claim for environmental damage before the Claims Commission, the Commission specifically applied IHL standard and decided that there was not sufficient evidence to prove that the destruction of environmental resources was widespread and long-lasting.¹⁸⁵

Regarding the implementation of obligations of freshwater law, different treaties provide for joint institutional mechanisms. For instance, the UNECE Water Convention requires Member States to conclude agreements or arrangements and adapt existing ones to implement the Convention and establish joint bodies tasked with addressing transboundary issues.¹⁸⁶

Domestic laws that transpose freshwater law obligations could impose environmental accountability, including criminal responsibility. Most agreements on transboundary freshwaters do not recognize the need to create criminal

181 See Droegge and Tougas, *supra* note 81, at 44–45.

182 Draft Principles on protection of the environment in relation to armed conflict, *supra* note 94, Principles 4 and 17.

183 See Fleck, *supra* note 124, at 212–215.

184 See C.R. Payne, 'Protection of the Natural Environment', in B. Saul and D. Akande (eds), *The Oxford Guide to International Humanitarian Law* (2020) 205–234, at 206.

185 *Partial Award: Central Front — Ethiopia's Claim 2*, Eritrea-Ethiopia Claims Commission, 28 April 2004, § 100.

186 Art. 9 UNECE Water Convention.

offences related to freshwater. However, there are some examples where some changes in this approach may be identified. The Water Charter for the Lake Chad Basin enunciates that the payment of the pollution tax does not exempt natural or legal persons, private or public, from their criminal liability in the event of behaviour constituting offences under domestic law.¹⁸⁷ Moreover, the Water Charter of the Niger Basin in its Annex on Environmental Protection states that the authors and accomplices of bushfires shall be liable for civil and criminal penalties.¹⁸⁸

The International Criminal Court (ICC) Statute, in the context of international armed conflict, criminalizes an attack which is launched with the knowledge that it will cause widespread, long-term, and severe damage to the natural environment, including to water resources, which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated.¹⁸⁹ The ICC, international tribunals and courts could consider the notion of war crimes in the context of allegations of intentional destruction of water installations and deliberate contamination of freshwater.¹⁹⁰ The deprivation of freshwater could also be part of the crime of starvation (including under ICC Statute) and is strongly condemned by the UN Security Council.¹⁹¹

D. Specific International Regulations of Transboundary Water Resources

States sharing transboundary watercourses must 'employ their best efforts to maintain and protect installations, facilities and other works related to an international watercourse'¹⁹² and this entails taking precautionary measures already taken in peacetime and during and post-conflict situations. As highlighted earlier, Article 29 of the UN Watercourses Convention affirms that international watercourses and related installations are protected under IHL applicable to both IAC and NIACs.¹⁹³ The reference to IHL under the Convention does not exclude its applicability but emphasizes that IHL rules protect international watercourses and related installations and facilities.

187 Art. 26 Water Charter of the Lake Chad Basin.

188 Art. 71, Niger Basin Water Charter, 30 April 2008. The Annex on Environmental Protection was adopted by the Council of Minister of the Niger Basin Authority on 1 October 2011.

189 See Art. 8(2)(b)(iv) ICCSt.

190 See P. Sands and J. Peel, *Principles of International Environmental Law* (4th edn., Cambridge University Press, 2018), at 761; and J. Wyatt, 'Law-Making at the Intersection of International Environmental, Humanitarian and Criminal Law: The Issue of Damage to the Environment in International Armed Conflict', 92 *IRRC* (2010) 593–646.

191 See Art. 8(2)(b)(xxv) ICCSt., and for NIACs see amendment under Resolution ICC-ASP/18/Res. 5; and SC Res. 2573, 27 April 2021, § 4.

192 Art. 26(1) UN Watercourses Convention.

193 For a genealogy of the legal framework on the protection of watercourses during armed conflicts, see Tignino, 'International Watercourses and Installations in Time of Armed Conflicts; the Obligation of Cooperation and Indirect Procedures; Exchange of Information and Protection of Data and Information Vital to National Defence or Security (Articles 29–31)', in L. Boisson de Chazournes et al. (eds), *The UN Convention on the Law of the Non-Navigational Uses of International Watercourses: A Commentary* (2018) 301–342, at 302–310.

There are three points to emphasize in relation to the regulation of transboundary watercourses. First, the UN Watercourses Convention under Article 10 (2) gives special regard to 'vital human needs' (i.e. generally understood as sufficient water to sustain human life, including both drinking water and water required for the production of food in order to prevent starvation) when allocating scarce water resources.¹⁹⁴ The Berlin Rules also incorporated this notion 'in determining an equitable and reasonable use, states shall first allocate waters to satisfy vital human needs'.¹⁹⁵ Correspondingly, the Madrid Rules underscored that 'arrangements should be made for the safeguarding of uninterrupted delivery of water supplies indispensable for the vital needs of the people'.¹⁹⁶ Poisoning or rendering water resources unfit for use will jeopardize vital human needs. In fact, the Geneva Conventions of 1949, AP I and AP II recognized the importance of water and sanitation for the health and survival of the persons they protect.¹⁹⁷ Nevertheless, the recognition of 'vital human needs' has a significant implication for ensuring access to water in situations of armed conflicts.¹⁹⁸ The provision under the UN Watercourses Convention is broader in its scope of application focusing on transboundary waters, and in that, it complements IHL.

Second, as discussed above, the rules on the need to continue cooperation on issues of transboundary waters even when diplomatic relations between states are severed. The 'indirect procedures' foreseen under the UN Watercourses Convention offer a practicable solution to fulfil their obligation of cooperation, including transfer of data and information, notification, communication, and consultations, during armed conflicts. This could include communicating a list of installations, works or facilities related to an international watercourse or transboundary aquifer with their geographical location and information on the human and environmental impacts of incidents caused by the armed conflict to minimize and manage the damage. In practice, joint institutional mechanisms and commissions at times remain functional between states even during armed conflicts. For example, the Permanent Indus Commission, established under the Indus Waters Treaty between India and Pakistan, has maintained its work through armed conflicts between the states. Equally, the *Organisation pour la mise en valeur du Fleuve Senegal* (OMVS)

194 T.S. Bulto, 'The Emergence of the Human Right to Water in International Human Rights Law: Invention or Discovery?' 12 *Melbourne Journal of International Law* (2011) 1–25, at 23–25; See S.M.A. Salman and S. McInerney-Lankford, *The Human Right to Water: Legal and Policy Dimensions*, Law, Justice, and Development Series (World Bank, 2004), at 14; and *Report of the Sixth Committee Convening as Working Group of the Whole*, UN Doc. A/51/869, 11 April 1997, at 5 ('In determining "vital human needs", special attention is to be paid to providing sufficient water to sustain human life, including both drinking water and water required for production of food in order to prevent starvation').

195 Art. 14(1) Berlin Rules, *supra* note 96.

196 Art. VIII Madrid Rules, *supra* note 96.

197 See Arts 20, 26, 29 and 46 Geneva Convention III; Arts 85, 89 and 127 Geneva Convention IV; Arts 54 and 55 AP I; and Arts 5 and 14 AP II.

198 L. Boisson de Chazournes, *Fresh Water in International Law* (2nd edn., Oxford University Press, 2021), at 221.

continued its work during the conflict between Mauritania and Senegal and had a role in reinitiating the diplomatic ties between the two countries. Moreover, the Mekong Committee also did not discontinue its activities during the conflict in Vietnam. Another relevant example concerns the conflict in Kosovo in 1999. In this case, the International Commission for the Protection of the Danube River (ICDPR), established under the Convention on cooperation for the protection and sustainable use of the Danube river of 1998, assisted UNEP in carrying out its assessment activities on the impacts of the military operations on the waters of the Danube from Serbia to Bulgaria and Romania after the armed conflict.¹⁹⁹ Notwithstanding the armed conflict, the Convention on cooperation for the protection and sustainable use of the Danube river continued to be applied by the parties and was a valuable mechanism of cooperation at the end of the conflict. The Sava River Basin Commission, the first cooperation mechanism established between Slovenia, Croatia, Bosnia–Herzegovina and Serbia at the end of the armed conflicts, is also another example.²⁰⁰

Third, the UN Watercourses Convention introduced ‘equality of access to transboundary remedies’, based on the principle of non-discrimination, i.e., ‘a watercourse State shall not discriminate on the basis of nationality or residence or place where the injury occurred, in granting . . . access to judicial or other procedures, or a right to claim compensation or other relief in respect of significant harm caused by such activities carried on in its territory’.²⁰¹ This requires states to make domestic remedies available to address water and environmental issues, including for transboundary claimants. The absence of meaningful recourse for individuals under IHL could be remedied by ensuring equal access to transboundary claimants.

5. Conclusion

IHL plays a limited role in providing protection to freshwater and related installations. It includes rules protecting objects indispensable to the survival of the civilian population, installations containing dangerous forces such as dams and dykes and the prohibition to use methods or means of warfare that are intended, or may be expected, to cause widespread, long-term and severe damage to the environment. This means that freshwater in itself is not protected. The prohibitions under IHL have an anthropocentric perspective focusing on the protection of the civilian population and civilian objects. Freshwater law may inform and complement IHL rules underlining the need to protect freshwater for its own social, environmental, economic and spiritual value.

The preventive, precautionary, sustainability and intergenerational equity principles stem from IEL but have also been integrated into freshwater agreements. While IHL principles on prevention and precaution remain largely

199 UNEP, *Kosovo*, *supra* note 22, at 28.

200 Framework Agreement on the Sava River Basin, 3 December 2002, 2367 UNTS 688.

201 Art. 32 UN Watercourses Convention.

vague and amorphous, these principles of both IEL and freshwater law could help refine the content of IHL principles and enhance their protective roles. In addition, freshwater law plays a complementary role by setting standards (e.g. on the threshold of environmental harm, the duty to cooperate, ensuring public participation and the right to receive information), introducing new rules (e.g. the introduction of 'protected zone' for ecological or cultural values) and providing mechanisms of enforcement and procedural remedies.

Moreover, in the context of transboundary harm, rules of freshwater law play a significant role. For instance, the introduction of the notion of 'vital human needs' has an implication for ensuring access to water to the civilian population in situations of armed conflicts. Also, requiring states to create joint river basin organizations or commissions and 'indirect procedures' during armed conflicts so as to maintain cooperation and exchange of information on matters affecting the watercourses is innovative and necessary as usually armed conflicts hinder diplomatic relations between belligerent parties. Moreover, ensuring 'equality of access to transboundary remedies' based on the principle of non-discrimination for transboundary claimants required under the UN Watercourses Convention has a significant gap-filling role.