Part Four:
Responsibility and Liability of States

Chapter 9:
State Responsibility for Transboundary Harm Caused by Biotechnology

Chapters 6 to 8 have analysed the rules of international law relating to operator liability, i.e. the liability of persons and entities who carry out activities involving biotechnology or products of biotechnology. However, as mentioned above, liability may be imposed not only on the responsible operator but also on the state on whose territory or under whose jurisdiction a hazardous activity is conducted, or a noxious LMO is released.[1] The present chapter discusses the liability[2] of a source state (or 'state of origin'[3]) for such damage under the international law of *state responsibility*, which governs the consequences of breaches of international legal obligations by states.

Although the international law of state responsibility for internationally wrongful acts can certainly be described as one of the cornerstones of the modern international legal order, it has never been codified in a binding international treaty. After several decades of work on this topic,[4] the ILC adopted *Draft Articles on the Responsibility of States for Internationally Wrongful Acts* (ARSIWA) in 2001.[5] While the Articles did not culminate in the

1 See chapter 2, section D.

2 On the use of the term 'liability' in relation to 'responsibility', see the clarifications in chapter 2, section C.

3 The terms 'state of origin' and 'source state' are used synonymously to refer to the state from which transboundary harm originates; see chapter 2, section D.

4 On the historical development of the topic, see *James Crawford*, State Responsibility: The General Part (2013), 3–44.

5 ILC, Draft Articles on Responsibility of States for Internationally Wrongful Acts, with Commentaries (2001), YBILC 2001, vol. II(2), p. 31 (hereinafter 'ARSIWA'). On the reference to 'draft' articles, see UN OLA, Materials on the Responsibility of States for Internationally Wrongful Acts, UN Doc. ST/LEG/SER.B/25 (2012), ix, which states: 'In accordance with its Statute, the International Law Commission adopts "draft" instruments, including "draft articles". In the recent practice of the General Assembly, when draft articles, as presented by the Commission, are taken note of by the Assembly and annexed to one of its resolutions, the reference to "draft" is excluded.'

adoption of a treaty either,[6] the UN General Assembly expressly commended the Articles to governments.[7] Today, they are generally regarded as largely reflecting the pertinent rules of customary international law.[8]

While the Supplementary Protocol, as shown above, provides a dedicated legal framework on liability for damage resulting from LMOs, the general regime on state responsibility remains relevant for two reasons. *Firstly*, there will be situations in which the Supplementary Protocol is inapplicable or insufficient.[9] This may be the case, for instance, when the state concerned is not a party to the Supplementary Protocol, when the organism causing harm does not fulfil the definition of an LMO, when the resulting damage does not qualify as an adverse effect on the conservation and sustainable use of biological diversity, or when the resulting damage does not qualify as an adverse effect on the conservation and sustainable use of biological diversity.

Secondly, the Supplementary Protocol focuses on *operator liability*, i.e. the liability of legal or natural persons who carry out activities involving LMOs.[10] However, the state in which such activities are carried out may

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6 See *James Crawford/Simon Olleson*, The Continuing Debate on a UN Convention on State Responsibility, 54 (2005) ICLQ 959.

7 See UNGA, Resolution 56/83. Responsibility of States for Internationally Wrongful Acts, UN Doc. A/RES/56/83 (2001).

8 Cf. *Daniel Bodansky/John R. Crook*, Symposium: The ILC's State Responsibility Articles, 96 (2002) AJIL 773; in ICJ case law, see e.g., ICJ, Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosnia and Herzegovina v. Serbia and Montenegro), Judgment of 26 February 2007, ICJ Rep. 43, paras. 385–415; on the reception of the ARSIWA by the ICJ generally, see *James Crawford*, The International Court of Justice and the Law of State Responsibility, in: Christian J. Tams/James Sloan (eds.), The Development of International Law by the International Court of Justice (2013) 71, 81–85; UN OLA (n. 5); in investment arbitration, see e.g. ICSID, Biwater Gauff (Tanzania) Ltd. v. Tanzania, Award of 24 July 2008, ICSID Case No. ARB/05/22, paras. 773–774; ICSID, Corn Products International Inc. v. Mexico, Decision on Responsibility of 15 January 2008, ICSID Case No. ARB(AF)/04/01, para. 76. For critical views on the widespread perception of the ARSIWA as codifications of customary international law, see *David D. Caron*, The ILC Articles on State Responsibility: The Paradoxical Relationship Between Form and Authority, 96 (2002) AJIL 857; *Fernando L. Bordin*, Reflections of Customary International Law: The Authority of Codification Conventions and ILC Draft Articles in International Law, 63 (2014) ICLQ 535.

9 *Gurdial S. Nijar* et al., Developing a Liability and Redress Regime Under the Cartagena Protocol on Biosafety: For Damage Resulting from the Transboundary Movements of Genetically Modified Organisms (2005), 8.

10 See chapter 2, section D.

also be responsible for damage, namely when it has not complied with its own obligations under international law. In this regard, it is important to note that states cannot discharge their own responsibility for environmental damage under international law by entering into agreements providing for operator liability, even when the damage is ultimately caused by a private actor.[11] The Supplementary Protocol expressly recognizes this by providing that it shall not affect 'the rights and obligations of States under the under the rules of general international law with respect to the responsibility of States for internationally wrongful acts'.[12]

The ARSIWA are rooted in the principle that 'every internationally wrongful act of a State entails the international responsibility of that State'.[13] The Articles are divided into four parts, which also set the framework for the present chapter: *Part One* sets out requirements under which state responsibility arises, namely that there is conduct that is attributable to the state in question and that constitutes a breach of an international obligation of that state (A.).[14] *Part Two* addresses the legal consequences arising from state responsibility once it has been established; besides ceasing the wrongful conduct and, where necessary, offering assurances of non-repetition, the responsible state must make full reparation for any injury caused by the damage (B.).[15] *Part Three* addresses the implementation of state responsibility (C.).[16] *Part Four* contains general provisions on the relationship between the ARSIWA and other rules of international law.[17]

A. *Requirements of the International Responsibility of a State*

As set out above, the international responsibility of a state arises from an 'internationally wrongful act'. Article 2 of the ILC's Articles on State Responsibility provides:

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11 *Nijar* et al. (n. 9), 8.
12 Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety (15 October 2010; effective 05 March 2018), UN Doc. UNEP/CBD/BS/COP-MOP/5/17, p. 64 (hereinafter 'Supplementary Protocol'), Article 11; see chapter 6, section E.III.
13 ARSIWA (n. 5), Article 1.
14 *Ibid.*, Articles 1–27.
15 *Ibid.*, Articles 28–41.
16 *Ibid.*, Articles 42–54.
17 *Ibid.*, Articles 55–59.

> *'There is an internationally wrongful act when conduct consisting of an action or omission*
> *(a) is attributable to the State under international law; and*
> *(b) constitutes a breach of an international obligation of the State.'*

Consequently, three requirements must be met for a state to be internationally responsible for transboundary harm: Firstly, there must be *conduct*, which may consist of an action or omission (I.). Secondly, this conduct must be *attributable* to the state in question (II.). Thirdly, such conduct must constitute a *breach of an international obligation* of that state (III.). But under certain circumstances, the *wrongfulness* of conduct which would otherwise be in breach of international law is *precluded* (IV.).

I. Conduct Consisting of an Action or Omission

Article 2 ARSIWA postulates that the conduct of a state that can give rise to international responsibility may consist of an action or an omission. While *actions* are usually easy to identify, identifying an *omission* from the relevant surrounding circumstances can be more difficult.[18] In legal terms, the term 'omission' denotes neglect of duty, i.e. a failure to act despite a legal duty to do so.[19] Therefore, an omission always depends on the existence of a positive primary obligation to act.[20] An omission is committed by a failure to act in accordance with the obligation, either by remaining inactive at all or by taking only partial or insufficient action.

The issue of breaches committed by omissions is particularly relevant in the context of responsibility for transboundary harm, because most hazardous activities are not carried out by state organs but by private persons or entities. As shown below, the conduct of private actors is not generally attributable to a state.[21] Hence, although the ultimate cause of transboundary harm is usually an action, namely the conduct of carrying out the hazardous activity, state responsibility commonly arises from a failure to take appropriate measures to prevent harm, and thus from an

18 *Ibid.*, Commentary to Article 2, para. 4, fn. 64.
19 *Crawford* (n. 4), 218; cf. 'omission', in: *Bryan A. Garner* (ed.), Black's Law Dictionary (11th ed. 2019), 1311.
20 *Crawford* (n. 4), 218; *Franck Latty*, Actions and Omissions, in: James Crawford/Alain Pellet/Simon Olleson (eds.), The Law of International Responsibility (2010) 355, 357–358.
21 ARSIWA (n. 5), Commentary to Chapter II, para. 3; see *infra* section A.II.2.

omission. But responsibility may also result from a combination of actions and omissions, for instance, when a state *authorizes* the release of an LMO but *omits* to impose and enforce appropriate preventive measures. Similar situations may arise when the hazardous activity itself is attributable to the state.

II. Attribution

In the previous section it was shown that a distinction must be drawn between the actual conduct of developing, importing or releasing an LMO (either by state or non-state actors) on the one hand, and acts undertaken (or omitted) by the authorities of a state to authorize and regulate such conduct on the other. This raises the question under which circumstances a particular conduct or omission is considered to be that 'of' the state.

Article 2(a) ARSIWA stipulates that a state can only be held responsible for conduct that is 'attributable' to it under international law. The purpose of attribution is to determine whether a certain conduct is considered to be an 'act of state' and thus capable of giving rise to state responsibility.[22] Thus, attribution reflects the principle that a state is not generally responsible for the conduct of all human beings, organizations or corporations that are linked by nationality, habitual residence or incorporation.[23] Instead, the responsibility of a state under international law only extends to organs of its government organs and those who act under the direction, instigation or control of these organs.[24] The conduct of non-state actors is not generally or automatically attributable to the state.[25] Hence, the doctrine of attribution serves to draw the line between the private realm and those acts or omissions which are considered 'acts of the state' and

22 *Ibid.*, Commentary to Chapter II, para. 2; *Crawford* (n. 4), 113; *Joanna Kulesza*, Due Diligence in International Law (2016), 93.

23 ARSIWA (n. 5), Commentary to Chapter II, para. 2; see *Lucas Bergkamp*, Liability and Environment (2001), 158; *Olivier* de *Frouville*, Attribution of Conduct to the State: Private Individuals, in: James Crawford/Alain Pellet/Simon Olleson (eds.), The Law of International Responsibility (2010) 257.

24 ARSIWA (n. 5), Commentary to Chapter II, para. 2; see *Malcolm N. Shaw*, International Law (8th ed. 2017), 595.

25 ARSIWA (n. 5), Ch. II, para. 3; see *Roberto Ago*, Fourth Report on State Responsibility, YBILC 1972, Vol. II, 126 (1972), paras. 145–146; *Cedric Ryngaert*, State Responsibility and Non-State Actors, in: Math Noortmann/August Reinisch/Cedric Ryngaert (eds.), Non-State Actors in International Law (2015) 163, 163.

can thus give rise to international responsibility.[26] Notably, a state may nevertheless be responsible for the result of the conduct of private actors when it fails to take necessary measures to prevent those effects despite being obliged to do so.[27] However, this concerns the scope of respective preventive obligations, not attribution.[28]

Whether certain conduct is attributable to a state primarily depends on the relationship between the acting person or entity and the state in question.[29] In principle, only conduct by the organs of a state and persons or entities exercising governmental authority is attributable (1.). Additionally, a state is responsible for the conduct of non-state actors to the extent that it directs or controls such conduct (2.). Moreover, the conduct of non-state actors can become attributable *ex post* when a state adopts and acknowledges such conduct as its own (3.). Attribution may also follow from *lex specialis* norms (4.) or, according to international jurisprudence, from international human rights law (5.).

1. Conduct by State Organs and Persons Exercising Governmental Authority

The most straightforward type of attribution applies to the conduct of the *organs* of a state. The ARSIWA do not give an abstract definition of the term 'organ', but only provide that it includes 'any person or entity which has that status in accordance with the internal law of that State'.[30] It is not relevant for attribution what particular functions the organ exercises or what position it holds in the internal organisation of the state.[31] Moreover, attribution extends to the conduct of persons or entities empowered by the law of the state to exercise 'elements of governmental authority',[32] as well as state organs placed at the disposal of another state.[33]

Hence, whether a particular actor's conduct is attributable under one of these categories largely depends on the domestic constitutional and legal

26 *Hanqin Xue*, Transboundary Damage in International Law (2003), 74.
27 Cf. ARSIWA (n. 5), Commentary to Chapter II, para. 4.
28 See chapter 4, in particular section E.
29 See generally *Edwin M. Borchard*, Theoretical Aspects of the International Responsibility of States, 1 (1929) ZaöRV 223, 228–231.
30 ARSIWA (n. 5), Article 4(2); see *Borchard* (n. 29), 231–239.
31 ARSIWA (n. 5), Article 4(1).
32 *Ibid.*, Article 5.
33 *Ibid.*, Article 6.

rules of the state in question.[34] At the same time, the conduct of such actors is attributed even when they exceed their authority or contravene instructions.[35] This shows that the *legal authority* to act on behalf of the state is the primary factor for the first category of attribution.[36] At the same time, a state cannot escape its international responsibility by declaring certain institutions to be 'autonomous' or 'independent' from the executive government.[37] Moreover, it is irrelevant whether the conduct of a state organ may be classified as 'industrial or commercial' or *acta iure gestionis*.[38]

The identification of organs and *de facto* organs of a state is the most direct form of attribution as the conduct in question can immediately be assessed against the relevant obligations under international law. In other words, there is a legal presumption that the state's government is exercising *actual ultimate control* over the persons acting on its behalf.[39] Possible examples could be nuclear activities or genetic engineering conducted by a state's military.[40]

The conduct of a state's regulatory agencies is always directly attributable under Article 4 or 5 ARSIWA.[41] The same applies when a state fails to live up to its obligations under international law, regardless of whether this failure is caused by omissions by the legislature or regulatory agencies.[42] Consequently, a state may be internationally responsible for its failure to appropriately regulate the conduct of private or public actors under its jurisdiction that enables these actors to impose transboundary environmental interference.[43] For instance, when a state party to the Cartagena Protocol fails to apply the *Advance Informed Agreement* (AIA) procedure for

34 *Ibid.*, Commentary to Chapter II, para. 4; cf. *Crawford* (n. 4), 115.
35 ARSIWA (n. 5), Article 7; cf. *Crawford* (n. 4), 136–140.
36 Cf. *Xue* (n. 26), 76; ARSIWA (n. 5), Commentary to Article 7, para. 7. This is also confirmed by Article 4(2) ARSIWA, cf. ARSIWA (n. 5), Commentary to Article 4, para. 11. Also see *Ryngaert* (n. 25), 167.
37 ARSIWA (n. 5), Commentary to Chapter II, para. 6.
38 *Ibid.*, Commentary to Article 4, para. 6; see 'Actum iure gestionis', in: *Aaron X. Fellmeth/Maurice Horwitz*, Guide to Latin in International Law (2011), 14.
39 *Xue* (n. 26), 76; cf. ICJ, Difference Relating to Immunity from Legal Process of a Special Rapporteur of the Commission on Human Rights, Advisory Opinion of 29 April 1999, ICJ Rep. 62, para. 62.
40 Cf. *Xue* (n. 26), 77.
41 *Rebecca M. Bratspies*, State Responsibility for Human-Induced Environmental Disasters, 55 (2012) German YBIL 175, 203; *Crawford* (n. 4), 127–128.
42 Cf. *Latty* (n. 20), 361; *Bratspies* (n. 41), 203–204.
43 Cf. *Bratspies* (n. 41), 204–205, who observes that the 'notion that the failure to regulate adequately can breach international legal obligations, thereby triggering State responsibility is gaining traction across a wide range of international fora'.

transboundary movements of LMOs,[44] such failure is always attributed to the state, regardless of which governmental organ or agency would have been responsible for implementing the AIA procedure according to the internal division of powers in that state.

2. Conduct by Persons Instructed or Controlled by the State

The second type of attribution concerns the conduct of private or non-state actors. The central provision on this matter in the ILC's Articles on State Responsibility is Article 8, which reads:

> *'The conduct of a person or group of persons shall be considered an act of a State under international law if the person or group of persons is in fact acting on the instructions of, or under the direction or control of, that State in carrying out the conduct.'*

Hence, whether conduct is attributable under Article 8 ARSIWA depends on whether a particular act is carried out 'under the instructions of, or under the direction or control' of a state. In contrast to Articles 4 to 7 ARSIWA, the decisive factor here is not the legal status of the actor, but whether the conduct in question is *in fact* influenced by the state.[45] Article 8 ARSIWA codifies customary international law, as held by the *International Court of Justice* (ICJ) in the *Bosnian Genocide* case.[46]

The following section analyses the different criteria for attribution under Article 8 ARSIWA (a)). Subsequently, these criteria are tested in different scenarios of activities relating to biotechnology carried out by non-state actors (b)).

a) The Criteria for Attribution Under Article 8 ARSIWA

According to the wording of Article 8 ARSIWA, the decisive criterion for attributing conduct of non-state actors is whether such conduct is carried out 'under the instructions of, or under the direction or control' of a state. According to the ILC's commentary to Article 8, the terms 'instructions', 'direction' and 'control' are used disjunctively, and it shall

44 See chapter 3, section A.II.1.
45 Cf. ARSIWA (n. 5), Commentary to Article 8, para. 2.
46 ICJ, Bosnian Genocide (n. 8), para. 398.

suffice to establish any one of them.[47] However, the commentary does not provide definitions of these terms and seems to treat the terms 'direction' and 'control' as synonyms.[48] In scholarly literature, there is a tendency to conflate all or some of the criteria; most commonly, the terms 'direction and control' are regarded as denoting a single standard of attribution.[49] This is supported by a strictly grammatical interpretation of Article 8 ARSIWA – as there is no comma before for the 'or', 'direction or control' could be seen as a single category.[50] At the same time, the genesis of Article 8 rather supports the assumption that the ILC intended to include three separate criteria.[51]

aa) Instruction

The first criterion for attribution is that the non-state person or entity acts 'on the instructions of' the state. The term 'instruction' denotes an 'authoritative order to be obeyed'.[52] Hence, an instruction can be assumed when a state decides to engage in particular conduct and instructs a non-state entity to do so on its behalf.[53] Moreover, the non-state actors must be 'factually subordinate' to the state at the moment when the acts in question

47 ARSIWA (n. 5), Commentary to Article 8, para. 7.

48 *Kubo Mačák*, Decoding Article 8 of the International Law Commission's Articles on State Responsibility: Attribution of Cyber Operations by Non-State Actors, 21 (2016) Journal of Conflict and Security Law 405, 411; cf. ARSIWA (n. 5), Commentary to Article 8, para. 1, which refers to 'two such circumstances', the first involving private persons acting on the instructions of the State, the second dealing 'with a more general situation were private persons act under the State's direction or control'.

49 *Crawford* (n. 4), 146; *Shaw* (n. 24), 598; *André J.* de *Hoogh*, Articles 4 and 8 of the 2001 ILC Articles on State Responsibility, the Tadić Case and Attribution of Acts of Bosnian Serb Authorities to the Federal Republic of Yugoslavia, 72 (2002) BYIL 255, 277–278. A different stand is taken by *Cassese*, who assumes that the first and second criteria are similar, while the third test is, in his view, 'rather loose', cf. *Antonio Cassese*, The Nicaragua and Tadic Tests Revisited in Light of the ICJ Judgment on Genocide in Bosnia, 18 (2007) EJIL 649, 663.

50 Cf. *Robert Heinsch*, Conflict Classification in Ukraine: The Return of the "Proxy War"?, 91 (2015) International Law Studies 323, 348.

51 *Mačák* (n. 48), 412–414.

52 Cf. 'instructions, n.', in *James Murray* et al., Oxford English Dictionary, Online Edition, available at: http://www.oed.com/ (last accessed 28 May 2022).

53 *Mačák* (n. 48), 414.

are committed.[54] While it may be sufficient that the non-state actor simply accepts the instructions given by the state and acts on them, attribution is not established when a state merely instigates, encourages or incites non-state actors to commit certain actions.[55] Furthermore, the instructions must order a specific, identifiable conduct.[56] As the ICJ held in the *Bosnian Genocide* case, the relevant instructions must be given 'in respect of each operation in which the alleged violations occurred, not generally in respect of the overall actions taken by the person or groups of persons having committed the violation'.[57] Although the case concerned the attribution of war crimes, particularly the massacre at *Srebrenica* committed in the *Bosnian War*, the ICJ expressly noted that it applied the general rules of attribution under the law of state responsibility.[58] Consequently, the Court's assessment of the law of attribution is widely perceived to be relevant beyond the specific context in which they were made.[59]

As the wording of Article 8 ARSIWA indicates, attribution is only possible as long as the private person acts 'on' the instructions of the state. A state will not incur responsibility if the non-state actors exceed the specific instructions given to them, thus going beyond what was incidental to the course of action authorized by the state.[60] Indeed, under Article 8 ARSIWA a factual relationship between the state and the non-state actor is required, which no longer exists when the latter acts on its own.[61]

54 *Ibid.*, 415; *Crawford* (n. 4), 146.
55 *Mačák* (n. 48), 415–416, who points to specific rules prohibiting incitement to genocide or discrimination.
56 *Ibid.*, 416.
57 ICJ, Bosnian Genocide (n. 8), para. 400.
58 *Ibid.*, para. 401, noting that '[t]he rules for attributing alleged internationally wrongful conduct to a State do not vary with the nature of the wrongful act in question in the absence of a clearly expressed lex specialis'.
59 Cf. *Frouville* (n. 23), 266–267; *Mačák* (n. 48), 414–415; *Crawford* (n. 4), 156; see *infra* n. 85 and accompanying text.
60 ARSIWA (n. 5), Commentary to Article 8, para. 8; cf. *Mačák* (n. 48), 417. In this regard, there is a systematic difference to the attribution of conduct by state organs or agents, for which Article 7 ARISWA provides that such conduct is attributable even when the organ or agents exceeds its authority or contravenes instructions; see ARSIWA (n. 5), Commentary to Article 7, para. 7.
61 *Ibid.*, Commentary to Article 8, para. 8.

bb) Direction

The second criterion for attribution under Article 8 ARSIWA is that a person or entity acts under the 'direction' of the state. This criterion has received comparably little attention in scholarly literature and, as noted above, is often conflated with one of the other two.[62] For instance, the ICJ held in the *Bosnian Genocide* case that an act is attributable

> *'where an organ of the State gave the instructions or provided the direction pursuant to which the perpetrators of the wrongful act acted'.*[63]

Hence, the question arises of how to distinguish between 'instructions' and 'direction' of a state, particularly since the natural meaning of both terms appears to be quite synonymous.[64] According to *Crawford*,

> '*"Direction" implies a continuing period of instruction, or a relationship between the state and a non-state entity such that suggestion or innuendo may give rise to responsibility.'*[65]

Consequently, the criterion of 'direction' provides a lowered threshold of causality for the particular act in question but requires an underlying continued relationship between the state and the non-state actor. In other words, when a state 'nurtures a relationship of subordination' with a non-state person or entity and continuously guides the conduct of these actors, it may incur responsibility for an act even when it did not give an express instruction to commit that act.[66]

cc) Control

According to the final criterion of Article 8 ARSIWA, the conduct of non-state actors is attributable to a state when they act under the 'control' of that state in carrying out the conduct. This criterion is not only the most relevant but, arguably, also the most controversial of the three bases of

62 Cf. *Mačák* (n. 48), 417; see *supra* n. 49 and corresponding text.
63 ICJ, Bosnian Genocide (n. 8), para. 406.
64 Cf. 'direction, n.', in Oxford English Dictionary (n. 52), Sect. 1c, where the term is defined as '[t]he action […] of instructing how to proceed or act aright; authoritative guidance, instruction'.
65 *Crawford* (n. 4), 146 fn. 28.
66 *Mačák* (n. 48), 418.

attribution. The reason for this controversy is that the element of 'control' operates between two thresholds.

On the *upper* end, the scope of Article 8 is exceeded when a non-state actor is in 'complete dependence' and, ultimately, nothing more than an 'instrument' of the state.[67] In these situations, the non-state actor is regarded as a 'de facto organ' of the state which is responsible for the relevant conduct under Article 4 ARSIWA.[68] Delimiting this upper threshold of Article 8 is relatively straightforward and a rather theoretical exercise, as it concerns merely the legal basis on which the conduct is attributed.

Determining the *lower* threshold of Article 8 ARSIWA, i.e. the minimum level of control required for attribution, is more difficult. This is because it lies in the very nature of states to exercise a certain degree of control over the conduct of private persons and entities in their territory.[69] At the same time, it is also well recognized that a state does not bear a general responsibility for all unlawful acts perpetrated within its territory.[70] The central problem of Article 8 ARSIWA thus concerns the degree of control that the state must exercise for the conduct to be attributable.[71]

It is controversial under which circumstances a state is deemed to have 'control' over the conduct of non-state actors in the sense of Article 8 ARSIWA. As far as it is known, all international case law relevant to this issue relates to armed activities.[72] In the case concerning *Military and Paramilitary Activities in and against Nicaragua*, the ICJ held in 1986 that the conduct of non-state actors was only attributable to a state when the latter has 'effective control' over the activities during which the alleged violations of international law occurred.[73] Essentially, this required the state to be involved in planning the operations, choosing the targets and providing operational support.[74]

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67 ICJ, Bosnian Genocide (n. 8), para. 392; cf. *Paolo Palchetti*, De Facto Organs of a State, in: Wolfrum/Peters (ed.), MPEPIL, MN. 7–13; *Ryngaert* (n. 25), 171–172.

68 ICJ, Bosnian Genocide (n. 8), para. 406; see *Stefan Talmon*, The Responsibility of Outside Powers for Acts of Secessionist Entities, 58 (2009) ICLQ 493, 498–502.

69 *Mačák* (n. 48), 420.

70 ICJ, Corfu Channel Case (United Kingdom v. Albania), Merits Judgment of 09 April 1949, ICJ Rep. 4, 18.

71 Cf. ARSIWA (n. 5), Commentary to Article 8, paras. 4 et seq.

72 Cf. *Ryngaert* (n. 25), 169.

73 ICJ, Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America), Merits Judgment of 27 June 1986, ICJ Rep. 14, para. 115.

74 *Ibid.*, para. 112; see *Mačák* (n. 48), 421.

In its judgment in the *Tadić* case of 1999, the *International Criminal Tribunal for Former Yugoslavia* (ICTY) held that the required degree of control 'may vary according to the factual circumstances of each case'.[75] It confirmed that 'effective control' is required for attributing acts carried out by private individuals engaged by a state to perform specific actions.[76] At the same time, it assumed that the degree of control could be lower with regard to actions by organized and hierarchically structured groups, such as military or paramilitary units. In these instances, the ICTY deemed it sufficient that the state has 'overall control' over the group concerned.[77]

In its 2007 judgment in the *Bosnian Genocide* case, the ICJ refused to adopt the 'overall control' test developed by the ICTY. First, it noted that the ICTY's *Tadić* judgment did not concern questions of state responsibility but individual criminal responsibility.[78] Moreover, it held that the 'overall control' test broadened the scope of state responsibility far beyond the fundamental principle that a state is only responsible for its 'own' conduct, i.e. the conduct of persons acting, on whatever basis, on its behalf.[79] Instead, the ICJ considered it to be 'settled jurisprudence' that a state may only be responsible for the conduct of private actors when it has 'effective control' over these activities.[80]

As a result, it is sometimes assumed that there are two competing 'control tests' for attribution under Article 8 ARSIWA.[81] At the same time, it seems reasonable to lower the threshold for attribution in situations where states delegate power to semi-autonomous groups or organizations,[82] including so-called private military contractors.[83] Otherwise, states would be

75 ICTY, Prosecutor v. Duško Tadić, Judgment of the Appeals Chamber of 15 July 1999, IT-94–1, 38 ILM 1518, para. 118.
76 *Ibid.*, paras. 118–119.
77 *Ibid.*, para. 145; see *Talmon* (n. 68), 504–507.
78 ICJ, Bosnian Genocide (n. 8), para. 403; see ICTY, Tadić (n. 75), Separate Opinion of Judge Shahabuddeen, paras. 17–18; but see *Cassese* (n. 49), 655–664, arguing that the ICTY indeed addressed a question concerning the law of state responsibility, albeit in order to solve an issue of international humanitarian law.
79 ICJ, Bosnian Genocide (n. 8), para. 406.
80 *Ibid.*, paras. 402–406; see *Crawford* (n. 4), 156, noting that 'this determination effectively ends the debate as to the correct standard of control to be applied under Article 8'.
81 See e.g. *Kristen E. Boon*, Are Control Tests Fit for the Future? The Slippage Problem in Attribution Doctrines, 15 (2015) Melb. J. Int'l L. 1, 10; *Shaw* (n. 24), 598–599.
82 Cf. *Cassese* (n. 49), 665–667.
83 Cf. *Boon* (n. 81), 22.

able to evade their international responsibility by deliberately relinquishing control. The tests of 'effective control' and 'effective overall control' should thus not be seen as competing but as complementing each other depending on the situation to be assessed.

Considering that all of the above case law is placed in the context of armed activities, it could be questioned whether the standards developed in this context also apply outside this specific context,[84] such as in relation to the development and use of biotechnology products and LMOs. However, case law from other areas does not indicate any fundamental differences. For instance, in investor-state disputes concerning alleged breaches of international investment law, arbitral tribunals have repeatedly recognized that:

> *'International jurisprudence is very demanding in order to attribute the act of a person or entity to a State, as it requires both a general control of the State over the person or entity and a specific control of the State over the act the attribution of which is at stake; this is known as the "effective control" test.'*[85]

Consequently, it can be concluded that the 'effective control' test as formulated by the ICJ reflects general international law. Since there are no *lex specialis* rules providing for different standards of attribution in the present context, the 'effective control' test also applies to conduct that gives rise to transboundary harm, including in the context of biotechnology.

In any event, neither international jurisprudence nor legal scholarship has so far offered much guidance on when control is indeed 'effective' or 'overall effective'.[86] The ILC merely acknowledged that 'it is a matter for

84 *Ibid.*, 19–21.

85 ICSID, Jan de Nul NV and Dredging Intemational NV v. Egypt, Award of 06 November 2008, ICSID Case No. ARB/04/13, para. 173; confirmed in ICSID, Gustav F Hamester GmbH and Co KG v. Ghana, Award of 18 June 2010, ICSID Case No. ARB/07124, para. 179; UNCITRAL Arbitral Tribunal, White Industries Australia Limited v. Republic of India, Final Award of 30 November 2011, para. 8.1.18; but see ICSID, Bayindir Insaat Turizm Ticaret Ve Sanayi A.Ş. v. Islamic Republic of Pakistan, Award of 27 August 2009, ICSID Case No. ARB/03/29, noting that 'that the approach developed in […] areas of international law [concerning foreign armed intervention or international criminal responsibility] is not always adapted to the realities of international economic law and that they should not prevent a finding of attribution if the specific facts of an investment dispute so warrant.' See generally *Simon Olleson*, Attribution in Investment Treaty Arbitration, 31 (2016) ICSID Review 457.

86 Cf., e.g., *Crawford* (n. 4), 146–156; *Ryngaert* (n. 25), 165–168.

appreciation in each case' whether the degree of control calls for attribution of the relevant conduct or not.[87] As a general rule, it can be assumed that the law of state responsibility is 'conservative in nature' and 'tends to err on the side of non-attribution of responsibility for the conduct of private parties'.[88] However, it appears not to be inconceivable that unsolicited actions by non-state actors, such as laboratory research on or unauthorized releases of self-spreading LMOs, are in fact directed or controlled by a state and thus attributable to the latter.

Finally, it is important to note that the notion of 'control' over acts of non-state actors in the sense of Article 8 ARSIWA should not be confused with concepts of 'control' used in other areas.[89] As shown earlier, if a state exercises control (in the sense of *de facto* jurisdiction) over a territory, it must ensure that activities carried out in that territory do not cause significant transboundary harm.[90] Similarly, in the human rights context, the notion of control is used to determine the extraterritorial application of international human rights obligations.[91] However, whether a state exercises control over a territory or individuals and is thus responsible for human rights violations is not necessarily the same as whether it is responsible for the conduct of private actors under Article 8 ARSIWA.[92]

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87 ARSIWA (n. 5), Commentary to Article 8, para. 5.

88 *Mačák* (n. 48), 426; also see *Jacqueline Peel*, Unpacking the Elements of a State Responsibility Claim for Transboundary Pollution, in: S. Jayakumar/Tommy Koh et al. (eds.), Transboundary Pollution (2015) 51, 59.

89 *Boon* (n. 81), 4–6 notes that the concept of 'control' plays a role in at least ten different fields of international law.

90 See chapter 4, section B.II.

91 Cf. ICJ, Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory, Advisory Opinion of 09 July 2004, ICJ Rep. 136, paras. 107–111; ECtHR, Al-Skeini et al. v. the United Kingdom, Judgment of 07 July 2011, Application no. 55721/07, paras. 130–150; see *Ralph Wilde*, The Extraterritorial Application of International Human Rights Law on Civil and Political Rights, in: Scott Sheeran/Nigel Rodley (eds.), Routledge Handbook of International Human Rights Law (2014) 635, 640–649.

92 *Marko Milanović*, Extraterritorial Application of Human Rights Treaties (2011), 41–53, notes that 'state jurisdiction is not state responsibility'. Even so, this does not mean that both issues may not arise in combination. For instance, a state may be responsible when it entertains unrecognized militias that exercise de facto control in a foreign territory and commit potential human rights violations there, see *Marko Milanović/Tatjana Papić*, The Applicability of the ECHR in Contested Territories, 67 (2018) ICLQ 779, 283–284; but see *infra* section A.II.5.

b) Attribution of Private Activities Causing Transboundary Harm

In the following, the criteria for attributing private conduct to a state under Article 8 ARSIWA analysed above are applied to different scenarios in which activities are carried out by private actors but under the guidance or governance of a state cause transboundary harm. These cases include activities regulated by a state (aa)), state-owned and controlled enterprises (bb)), research and development activities by public institutions (cc)) and state-funded research activities by non-state actors (dd)).

aa) Regulatory Oversight

A literal understanding of the notion of 'control' in Article 8 ARSIWA could lead to the assumption that a state's regulatory oversight of a hazardous activity carried out by private actors justified attribution. This appears to be assumed by the ICJ judge *Xue*, who argues that activities conducted by private entities, 'but under the direct authorization and supervision of the state government' should be attributable under Article 5 or 8 ARISIWA.[93] In her view, this could include the nuclear industry, the space industry, some public transportation such as civil aviation and railways, and certain strictly controlled import and export activities.[94] *Xue* notes that

> *'an overly strict interpretation of the classical rules would result in a simplistic and unresponsive approach to the growing problems of transboundary activities conducted by the private sector'.*[95]

However, this understanding overstretches the scope of Articles 5 and 8 ARSIWA as laid out above and thus cannot be sustained.[96] Attributing each conduct to a state solely because there is a high degree of regulatory oversight would blur the lines between primary obligations (such as those to regulate private activities to avoid transboundary interference) and secondary obligations (such as to make reparation for harm resulting from a failure to appropriately regulate private activities). After all, there is no evidence that the threshold for attribution under Article 8 ARISWA is

93 *Xue* (n. 26), 77.
94 *Ibid.*
95 *Ibid.*, 78.
96 See *supra* sections A.II.1 and A.II.2.

lower than for the other bases of attribution. Instead, the decisive question is whether a state exercises control over a private activity to a degree similar to that of activities directly carried out by state organs.

For hazardous activities not attributable to the state under these standards, the obligation of states not to allow their territory to be used to the detriment of other states and corresponding preventive duties come into play.[97] Therefore, neither mere knowledge of a specific private activity nor its authorization by the administrative authorities of a state automatically renders this activity attributable to that state.[98] For instance, a permit allowing the release of a certain LMO into the environment does not make the *release* itself attributable to the relevant state. At the same time, the act of *issuing the permit* is attributable to the state, as is any other conduct of the regulatory agencies of a state.[99] This shows that careful distinction is required between the hazardous conduct itself and acts undertaken by the authorities of a state to authorize and regulate such conduct.

bb) Enterprises Owned and Controlled by a State

A different problem is posed by companies or enterprises owned and controlled by a state. If such companies act contrary to the international obligation of the state, the question arises of whether such conduct is attributable to the state in question.

In principle, international law accepts the distinct legal personality of corporations of which the state is the principal, or even the sole, shareholder.[100] Consequently, the mere fact that a state owns a corporate entity is not a sufficient basis for attributing the conduct of that entity to the state.[101] Instead, attribution is adjudged according to the general principles

97 See chapters 3 to 5.

98 ARSIWA (n. 5), Commentary to Article 11, para. 6; see *Barbara Saxler* et al., International Liability for Transboundary Damage Arising from Stratospheric Aerosol Injections, 7 (2015) Law, Innovation and Technology 112, 118–119.

99 See *supra* section A.II.1; cf. *Bratspies* (n. 41), 203–204.

100 See ICJ, Case Concerning the Barcelona Traction, Light and Power Company, Limited (New Application 1962, Second Phase), Judgment of 05 February 1970, ICJ Rep. 3, paras. 56–58; ARSIWA (n. 5), Commentary to Article 8, para. 6.

101 ARSIWA (n. 5), Commentary to Article 8, para. 6; cf. Judicial Committee of the UK Privy Council, La Générale des Carrières et des Mines v. FG Hemisphere Associates LLC (Gécamines), 17 July 2012, Appeal No 0061 of 2011, 2012 UKPC 27, paras. 15–29; see *Crawford* (n. 4), 162–163.

laid down in the ILC's Articles on State Responsibility. When a corporation is empowered to exercise elements of governmental authority, the conduct carried out in the exercise of such authority will be attributable to the state under Article 5 ARSIWA.[102] Moreover, when a state uses its ownership of or control over a corporation to direct it towards particular actions, the resulting conduct is attributable to the state in accordance with the standards formulated in Article 8 ARSIWA.[103]

It has been suggested that the 1986 nuclear accident at *Chernobyl* was an example of environmental harm caused by a state-owned enterprise in which neither Article 5 nor Article 8 ARSIWA were fulfilled.[104] The nuclear power plant at Chernobyl was not constructed and operated by the Soviet Union itself but by a state enterprise that possessed a legal personality distinct from that of the state.[105] At the same time, other authors assessing the potential international responsibility of the Soviet Union for the Chernobyl accident assumed that the Soviet Union was indeed the operator of the nuclear plant[106] but, in any event, had effective control over both the construction of the plant and the tests which had caused

102 ARSIWA (n. 5), Commentary to Article 5, para. 2, and Commentary to Article 8, para. 6; see IUSCT, Phillips Petroleum Company Iran v. The Islamic Republic of Iran et al., 29 June 1989, Award No. 425–39–2, 21 Iran–US CTR 79, paras. 88–120.

103 ARSIWA (n. 5), Commentary to Article 8, paras. 6–7; see ICSID, EDF (Services) Ltd. v. Romania, Award of 08 October 2009, ICSID Case No. ARB/05/13, paras. 209–213.

104 *Kirsten Schmalenbach*, Verantwortlichkeit und Haftung, in: Alexander Proelß (ed.), Internationales Umweltrecht (2017) 211, 217; also see *Sayed M. M. Zeidan*, State Responsibility and Liability for Environmental Damage Caused by Nuclear Accidents (2012), 307.

105 *René Lefeber*, Transboundary Environmental Interference and the Origin of State Liability (1996), 245. This was confirmed by German civil courts in an action for damages brought against the Soviet Union, see Amtsgericht Bonn, Schadensersatzklage gegen UdSSR wegen Tschernobyl-Kernreaktorunfalls (Action for damages against USSR for Chernobyl nuclear accident), Order of 29 September 1987, 9 C 362/86, 41 NJW 1393. The court dismissed the claims on the grounds that 'a third institution, AES Chernobyl, is the addressee of both the contract for the construction and the supervisory measures. This is an independent legal entity, which is endowed with its own property and is liable with it for damages caused' (own translation). Also see *B. A. Semenov*, Nuclear Power in the Soviet Union, 25 (1983) IAEA Bulletin 47.

106 *Linda A. Malone*, The Chernobyl Accident: A Case Study in International Law Regulating State Responsibility for Transboundary Nuclear Pollution, 12 (1987) Colum. J. Envt'l. L. 203, 238–240.

the disaster.[107] Although a number of states had expressly reserved their right to hold the Soviet Union accountable for damage resulting from the radioactive fallout caused by the incident, no state ever made any formal claims.[108] However, the reasons for this are probably less to be found in matters of attribution than in evidentiary issues, legal uncertainties (as there were no binding international nuclear safety standards[109]) and, of course, political considerations.[110]

No comparable issues of attribution were raised by the nuclear accident of 2007 at *Fukushima*, as the operator of the nuclear plant involved in the accident had already been privatized in the 1950s.[111] In any event, there have been no reports about adverse transboundary effects, apart from marine pollution resulting from the discharge of contaminated water into the sea.[112]

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107 *Victoria R. Hartke*, The International Fallout from Chernobyl, 5 (1987) Dickinson Journal of International Law 319, 329–330; *Lefeber* (n. 105), 243.

108 Cf. *Philippe Sands* (ed.), Chernobyl: Law and Communication (1988), 26–30; *Philippe Sands* et al., Principles of International Environmental Law (4th ed. 2018), 752–753.

109 *Lefeber* (n. 105), 344.

110 *Sands* et al. (n. 108), 753–754.

111 See *Eri Osaka*, Corporate Liability, Government Liability, and the Fukushima Nuclear Disaster, 21 (2012) Pacific Rim Law & Policy Journal 433; *Julius Weitzdörfer*, Die Haftung für Nuklearschäden nach japanischem Atomrecht – Rechtsprobleme der Reaktorkatastrophe von Fukushima I, 16 (2011) Zeitschrift für Japanisches Recht 61. A different view is taken, by *Bratspies* (n. 41), 206, who argues that 'the intertwined relationship of TEPCO [the company operating the Fukushima plant] and the Japanese government might also raise the possibility of a de facto agency relationship sufficient to establish direct State responsibility'.

112 See *Yen-Chiang Chang/Yue Zhao*, The Fukushima Nuclear Power Station Incident and Marine Pollution, 64 (2012) Marine Pollution Bulletin 897; also see *Kirsten Haupt/Thomas Mützelburg*, Global Radiation Monitoring in the Wake of the Fukushima Disaster, 16 (2011) CTBTO Spectrum 18, reporting that the monitoring system of the *Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization* (CTBTO) detected a global spread of radioactive particles and noble gases from Fukushima, although the radioactivity levels outside Japan were 'far below levels that could cause harm to humans and the environment'.

cc) Research and Development Activities by Public and Governmental Institutions

Attribution is also questionable with regard to research and development activities conducted by public research institutions, such as universities or governmental agencies.[113] These could be regarded as state organs because Article 4 ARSIWA provides that the status of a person or entity as a state organ does not depend on the exercise of legislative, executive or judicial functions but may also arise from the exercise of 'any other functions'. Moreover, attribution under Article 4 ARSIWA is not limited to sovereign or authoritative acts (*acta iure imperii*[114]) but also includes non-authoritative and commercial acts (*acta iure gestionis*[115]).[116] Consequently, research carried out by public research institutions or civil servants, such as professors and their staff, could be regarded as being attributable to the respective state.[117]

This finding is challenged by the fact that universities and other public research institutions often enjoy a high degree of independence from the government and commonly pursue their research free of instructions.[118] Moreover, as shown above, the conduct of commercial enterprises incorporated under private law but (predominantly) owned by the state is not generally attributable.[119] This would lead to the paradoxical situation that the same conduct would be attributed when performed by an entity established under the public law of a state, but not when carried out by a state-owned entity incorporated under private law.[120]

To resolve this discrepancy, it is necessary to distinguish between the different bases of attribution. Only Article 4 ARSIWA relies on the legal status of the acting person or entity. In contrast, all other bases for attribution rely on whether the actor in fact exercises (elements of) governmental

113 See *Constantin Teetzmann*, Schutz vor Wissen? (2020), 150–152.
114 Cf. *Fellmeth/Horwitz* (n. 38), 14.
115 Cf. *ibid.*
116 ARSIWA (n. 5), Commentary to Article 4, para. 6.
117 This appears to be assumed by the German Ethics Council, Biosecurity – Freedom and Responsibility of Research: Opinion (2014) at page 268 (fn. 581) of the German language version (the respective part is not included in the English translation).
118 *Teetzmann* (n. 113), 152.
119 See *supra* section A.II.2.a)bb).
120 Cf. *Teetzmann* (n. 113), 152.

authority[121] or acts under the instruction, direction, or control of the state.[122] As argued before, there is a legal presumption that persons or entities who qualify as *state organs* under the internal law of the state in the sense of Article 4(2) ARSIWA are acting on behalf, and under the control, of the state.[123] At the same time, there appears to be no state practice justifying the assumption that conduct can be attributed solely based on the actor's legal status, regardless of whether that actor is in fact exercising governmental powers.[124] Hence, the presumption that a person or entity bearing the status of a state organ always acts in that capacity should be regarded as refutable. If the relevant conduct does not constitute an exercise of governmental authority (i.e. constitutes *acta iure gestionis*) and would not be attributable under any of the other bases of attribution set out in Articles 5–8 ARSIWA, the mere legal status of the actor as a state organ will most likely not suffice to justify attribution.[125] Consequently, research and development activities conducted by public institutions are not attributable as long as these institutions are independent of the respective government and not acting on its instructions.[126]

However, it should be noted that academic freedom, despite being a fundamental human right,[127] is not guaranteed in many states around the

121 ARSIWA (n. 5), Articles 5–7.

122 *Ibid.*, Article 8; cf. *Ryngaert* (n. 25), 164.

123 See *supra* section A.II.1.

124 *Teetzmann* (n. 113), 141, points out that in both cases cited by the ILC in support of attributing acts of 'independent' State organs, attribution was ultimately justified by the fact that governmental authority was exercised. Moreover, both cases did not concern attribution, but sovereign immunity of State organs, and the ILC assumed that 'the same principle applies in the field of State responsibility', cf. ARSIWA (n. 5), Commentary to Article 11, para. 11 and n. 122.

125 Cf. *ibid.*, Commentary to Article 4, para. 13. Also see *Crawford* (n. 4), 129–130.

126 *Teetzmann* (n. 113), 152. On the contrary, *Mačák* (n. 48), 415, points out that 'if a State specifically instructed an IT department within a university to carry out a Distributed Denial of Service (DDoS) attack against a designated target, the resulting operation would be attributable to the State in question.'

127 Cf. Article 15(3) of the International Covenant on Economic, Social and Cultural Rights (16 December 1966; effective 03 January 1976), 993 UNTS 3, which reads: 'The States Parties to the present Covenant undertake to respect the freedom indispensable for scientific research and creative activity.' Also see CESCR, General Comment No. 25 (2020) On Science and Economic, Social and Cultural Rights, UN Doc. E/C.12/GC/25 (2020), para. 13, noting that this includes *inter alia*, 'protection of researchers from undue influence on their independent judgment; the possibility for researchers to set up autonomous research institutions and to define the aims and objectives of the research and the methods to be adopted.'

world. As pointed out by the *UN Special Rapporteur on the Right to Freedom of Opinion and Expression*, governments often interfere with the autonomy of academic institutions by exerting, among other things, political, financial, ideological, and/or social and cultural pressure.[128] At the same time, the realities of academic freedom do not yet seem to be a thoroughly studied field.[129] Researchers developed an *Academic Freedom Index* ranking countries for their overall academic freedom by relying on standardized *de iure* and *de facto* indicators.[130] But whether a particular research or development undertaking is in fact carried out free of instructions and control by the respective government may be difficult to determine. In any event, if a government exercises partial or full control over research and development activities, such activities become attributable to the state even when no governmental authority is imposed on third parties.[131]

dd) State-Funded Research and Development Activities

Finally, problems may arise regarding research and development activities conducted by non-state actors but funded by the state. Commonly, the state – like any other donor – has a certain degree of influence on the objective and conduct of the research it funds. Whether the research is attributable to the state depends on whether the relevant conduct is carried out 'under the instructions of, or under the direction or control' of the state in the sense of Article 8 ARSIWA.[132] Accordingly, research may be attributable when the state instructs the researchers to use particular methods or pursue certain goals or when the state can order the activities to cease at any time.[133] Furthermore, attribution may be assumed when a research objective permitted, commissioned, or ordered by a state constitutes

128 *David Kaye*, Report of the Special Rapporteur on the Promotion and Protection of the Right to Freedom of Opinion and Expression, UN Doc. A/75/261 (2020), para. 31.
129 *Katrin Kinzelbach* et al., Free Universities: Putting the Academic Freedom Index into Action (2020).
130 *Katrin Kinzelbach*, Introduction to the Study of Academic Freedom, in: Katrin Kinzelbach (ed.), Researching Academic Freedom (2020) 1–10.
131 *Teetzmann* (n. 113), 152.
132 See *supra* section A.II.2.a).
133 *Teetzmann* (n. 113), 153–154.

a breach of international law or even of *ius cogens*, such as the development of biological or chemical weapons.[134]

3. Attribution of Conduct Acknowledged and Adopted by the State as Its Own

Article 11 ARSIWA addresses the special case of *ex post facto* attribution.[135] Conduct which was not attributable at the time of its commission shall nevertheless be attributed 'if and to the extent that the State acknowledges and adopts the conduct in question as its own'.[136] The prime example of attribution under this rule is the *Tehran Hostages* case, in which the Iranian government issued a decree approving and maintaining the occupation of the embassy of the United States in Tehran and the taking as hostages of its diplomatic and consular staff by militant Iranian revolutionists.[137] In the context of environmental disputes, a further example of *ex post facto* attribution is the *Gabčíkovo-Nagymaros* case, where the ICJ concluded that Slovakia adopted the sole responsibility for the construction project after the dissolution of Czechoslovakia, and thus was liable to pay compensation not only for its own wrongful conduct but also for that of Czechoslovakia.[138]

4. Attribution by Lex Specialis Norms

Besides the rules of attribution set out in the ARSIWA, the conduct of non-state actors may also be attributed on the grounds of other norms of international law. Article 55 ARSIWA expressly recognizes the prevalence of *lex specialis* norms over the general law of state responsibility.[139] For instance, Article 139 of the *UN Convention on the Law of the Sea* (UNC-

134 See chapter 3, section J.I.
135 *Crawford* (n. 4), 181.
136 See ARSIWA (n. 5), Commentary to Article 11, para. 1.
137 Cf. *ibid.*, Commentary to Article 11, para. 4; see ICJ, United States Diplomatic and Consular Staff in Tehran, Judgment of 24 May 1980, ICJ Rep. 3, para. 74; *Crawford* (n. 4), 183–186.
138 ICJ, Gabčíkovo-Nagymaros Project (Hungary v. Slovakia), Judgment of 25 September 1997, ICJ Rep. 7, para. 151; see *Crawford* (n. 4), 186–187.
139 *Ibid.*, 114.

LOS)[140] provides that states are responsible for the conduct of private actors engaging in seabed mining activities, provided that these actors are nationals of that state or have been 'sponsored' by it.[141] Moreover, Article 263(3) UNCLOS provides, *inter alia*, that states shall be responsible and liable for damage caused by pollution of the marine environment arising out of marine scientific research undertaken on their behalf.[142] Another example can be found in Article VI of the *Outer Space Treaty*,[143] according to which states parties shall bear international responsibility for national activities in outer space, including when such activities are carried out by non-governmental entities.

5. Attribution of Transboundary Harm Through Human Rights Law?

A special form of attribution could also result from the interplay of international environmental law and international human rights law. In its 2018 advisory opinion on *Human Rights and the Environment*,[144] the *Inter-American Court of Human Rights* addressed the question of whether

140 United Nations Convention on the Law of the Sea (10 December 1982; effective 16 November 1994), 1833 UNTS 3 (hereinafter 'UNCLOS').

141 For details, see *Silja Vöneky/Anja Höfelmeier*, Article 139 UNCLOS, in: Alexander Proelss (ed.), United Nations Convention on the Law of the Sea: A Commentary (2017) 968. In the terminology of UNCLOS, the notion of sponsorship refers to a formal endorsement which is required for private undertaking to engage in seabed exploration or mining activities, cf. Article 153(3)(b) UNCLOS. In this context, also see ITLOS, Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area, Advisory Opinion of 01 November 2011, Case No. 17, ITLOS Rep. 10; *David Freestone*, Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area, 105 (2011) AJIL 755.

142 Note that Article 263(3) UNCLOS refers to Article 235, which makes additional provisions on responsibility and liability. By 'liability', UNCLOS refers to state responsibility, cf. *Tim Stephens*, Article 235 UNCLOS, in: Alexander Proelss (ed.), United Nations Convention on the Law of the Sea: A Commentary (2017), MN. 8.

143 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (27 January 1967; effective 10 October 1967), 610 UNTS 205.

144 IACtHR, The Environment and Human Rights (State Obligations in Relation to the Environment in the Context of the Protection and Guarantee of the Rights to Life and to Personal Integrity – Interpretation and Scope of Articles 4(1) and 5(1) of the American Convention on Human Rights), Advisory Opinion OC-23/18 of 15 November 2017, IACtHR Ser. A, No. 23.

the *American Convention on Human Rights* (ACHR)[145] applies to persons residing outside a state's territory who are affected by transboundary harm originating from that state. This depends on whether such persons are subject to the 'jurisdiction' of a state sense of Article 1(1) ACHR.

The Court first reiterated the established principles for the extraterritorial application of the Convention, namely that a person residing outside the territory of a state is nevertheless subject to the 'jurisdiction' of that state when the latter is exercising authority over the person or when the person is under the effective control of the said state.[146] Subsequently, it held:

> *'For the purposes of the American Convention, when transboundary damage occurs that effects treaty-based rights, it is understood that the persons whose rights have been violated are under the jurisdiction of the State of origin, if there is a causal link between the act that originated in its territory and the infringement of the human rights of persons outside its territory.'*[147]

In the Court's view, the exercise of jurisdiction is based on the understanding that the state in whose territory the activities are carried out has effective control over these activities and is in a position to prevent them from causing transboundary harm.[148] Consequently, the Court held that the potential victims of transboundary harm were 'under the jurisdiction of the state of origin for the purposes of the possible responsibility of that state for failing to comply with its obligation to prevent transboundary damage'.[149]

It has been criticized that the Court 'effectively conflate[d] the extraterritoriality threshold with the obligation to prevent transboundary damage'.[150] Indeed, the Court's approach is questionable because it ignores the 'effective control' test usually required for the extraterritorial application

145 American Convention on Human Rights (22 November 1969; effective 18 July 1978), 1144 UNTS 123.

146 IACtHR, Advisory Opinion on Human Rights and the Environment (n. 144), para. 81.

147 *Ibid.*, para. 101.

148 *Ibid.*, para. 102.

149 *Ibid.*

150 *Giovanny Vega-Barbosa/Lorraine Aboagye*, Human Rights and the Protection of the Environment: The Advisory Opinion of the Inter-American Court of Human Rights, EJIL: Talk!, 26 February 2018, available at: https://www.ejiltalk.org/human-rights-and-the-protection-of-the-environment-the-advisory-opinion-of-the-inter-american-court-of-human-rights/ (last accessed 28 May 2022).

of human rights treaties.[151] However, as noted earlier, the question of whether conduct is *attributable* to a state under the law of state responsibility is not the same as whether a state has *jurisdiction* in the sense of human rights law.[152] The mere fact that there is a causal link between an activity and adverse effects on the enjoyment of human rights abroad does neither automatically give rise to attribution nor effective control.[153] Consequently, the position of the Inter-American Court represents at best *progressive development* but does certainly not reflect the current rules of general international law.[154]

6. Conclusions

The preceding analysis has shown that, on the one hand, the conduct of the organs of a state and persons exercising governmental authority is generally attributable to that state. On the other hand, there is no general responsibility of a state for the conduct of private persons or entities. Neither mere knowledge of such conduct nor its authorization by a state's administrative authorities, such as a permit for releasing LMOs into the environment, automatically renders the activity itself attributable to the state in question.[155] The conduct of private actors is only attributable when the state exercises *effective control* over such conduct or *acknowledges and*

151 Notably, the Court itself noted that 'the situations in which the extraterritorial conduct of a State constitutes the exercise of its jurisdiction are exceptional and, as such, should be interpreted restrictively', IACtHR, Advisory Opinion on Human Rights and the Environment (n. 144), para. 81.

152 See *supra* section A.II.2.a)cc); see *Milanović* (n. 92), 41–52.

153 See *ibid.*, 126–127.

154 But see *Angeliki Papantoniou*, Advisory Opinion on the Environment and Human Rights, 112 (2018) AJIL 460–466, 465, who considers the Court's linking of extraterritorial jurisdiction with the obligation to prevent transboundary harm to be 'an important step toward bringing environmental claims with a transboundary element before human rights tribunals'. Also see *Maria L. Banda*, Regime Congruence: Rethinking the Scope of State Responsibility for Transboundary Environmental Harm, 103 (2019) Minnesota Law Review 1879–1690, 1932, arguing that transboundary harm could be covered by the 'direct effects' test developed by human rights tribunals, and that 'interpreting a State's duties under human rights law congruently with its obligations under international environmental law can further the goals of both regimes at their points of intersection' (*ibid.*, 1946).

155 ARSIWA (n. 5), Commentary to Article 11, para. 6; see *Saxler* et al. (n. 98), 118–119.

adopts it as its own. Both of these bases for attribution are subject to high thresholds.

At the same time, the conduct of state organs – consisting of actions or omissions – will mostly be *in relation* to the activities of non-state actors. The act of authorizing a private activity through administrative authorities constitutes attributable conduct, as does a state's failure to take action to prevent hazardous or harmful private activities. However, this does not render the activity *itself* attributable. Hence, it is crucial to clearly distinguish between the actual activity and the conduct of state organs in the realm of that activity. In most cases, only the latter can give rise to the responsibility of the state concerned.

III. Breach of an International Obligation

The second requirement of an internationally wrongful act is that the attributable conduct must constitute a breach of an international obligation. Article 12 ARSIWA provides that:

> *'There is a breach of an international obligation by a State when an act of that State is not in conformity with what is required of it by that obligation, regardless of its origin or character.'*

Hence, state responsibility arises when a relevant international obligation binds the state in question (1.) and when the state's conduct is 'not in conformity' with what is required from it by that obligation (2.). This also entails the question of whether the existence of fault is relevant (3.).

1. International Obligation of Any Origin or Character

The ILC has recognized that international obligations may be established by rules of customary international law, international treaties, and general principles of law which are applicable within the international legal order.[156] This corresponds with Article 38 of the Statute of the ICJ, which is commonly considered to contain an authoritative list of the sources

156 ARSIWA (n. 5), Commentary to Article 12, para. 3.

of international law.[157] In addition, states may also assume international obligations by unilateral acts.[158] In any case, the obligation must be in force for the state at the time when the relevant act occurs.[159]

As set out earlier in this study, the pertinent legal obligations can be distinguished into obligations to prevent adverse transboundary effects of LMOs on the one hand and obligations pertaining to liability and redress for such effects on the other.

Regarding the former type of obligations, it is generally recognized that a state may incur international responsibility for failing to comply with its obligations to prevent the causation of transboundary harm.[160] The pertinent treaty obligations, including from the *Convention on Biological Diversity* and its *Cartagena Protocol on Biosafety*, are assessed in chapter 3. Besides, the obligation to prevent significant transboundary harm, and ensuing procedural duties, is also part of universal customary international law, as discussed in chapter 4. The specific obligations regarding engineered gene drives are addressed in chapter 5.

Besides, a breach of international law may also occur when a state fails to comply with its international obligations to provide for liability and redress in case harm occurs.[161] The principal instrument in the present

157 Statute of the International Court of Justice (18 April 1946), 33 UNTS 993 (hereinafter 'ICJ Statute'), Article 38(1); cf. *James Crawford*, Brownlie's Principles of Public International Law (9th ed. 2019), 18.

158 ARSIWA (n. 5), Commentary to Article 12, para. 3.

159 *Ibid.*, Article 13.

160 See, e.g., *Lefeber* (n. 105), 60–98; *Crawford* (n. 4), 226–232; *Leslie-Anne Duvic-Paoli*, The Prevention Principle in International Environmental Law (2018), 331–339; ICJ, Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua) and Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica), Merits Judgment of 16 December 2015, ICJ Rep. 665, Separate Opinion of Judge Donoghue, para. 9; in conventional law, see Convention on the Regulation of Antarctic Mineral Resource Activities (02 June 1988; not in force), 27 ILM 868, Article 8(3)(a), which reads: 'Damage […] which would not have occurred or continued if the Sponsoring State had carried out its obligations under this Convention with respect to its Operator shall, in accordance with international law, entail liability of that Sponsoring State.' Also see UNCLOS (n. 140), Article 139(2), which provides that 'damage caused by the failure of a State Party or international organization to carry out its responsibilities under this Part shall entail liability'. On breaches of preventive obligations, see chapter 4, section E.

161 Institut de Droit International, Responsibility and Liability Under International Law for Environmental Damage: Resolution Adopted on September 4, 1997, 37 ILM 1474, Article 6(2).

context is the *Nagoya – Kuala Lumpur Supplementary Protocol*, which is assessed in chapter 6. Apart from treaty law, states arguably bear a customary obligation to ensure that victims of transboundary damage have access to prompt and adequate compensation as well as non-discriminatory remedies in their domestic legal system, as shown in chapter 8.

2. Conduct in Breach of the Obligation

To determine whether there is a breach of an international obligation, the conduct of the state must be compared with the conduct prescribed by the relevant obligation.[162] Unlike some domestic legal systems, international law does not distinguish between the contractual, tortious or criminal responsibility of states. Moreover, the severity of the breach is not relevant to the question of whether state responsibility arises, although it may affect the legal consequences of state responsibility.[163]

In some cases, the conduct expected from the state is precisely defined, while in others, the obligation only sets a minimum standard above which the state is free to act.[164] As shown earlier, determining breaches of *due diligence* obligations can be particularly difficult, as it requires an inquiry into what knowledge was available to the state at the time when action should have been taken and a determination whether, in light of this knowledge, a state had taken all measures which it could be reasonably expected to take in order to prevent the apprehended event from occurring.[165]

3. No Requirement of Fault

There is no general requirement of *fault* – such as intent or negligence – for state responsibility to arise.[166] Whether such a requirement exists depends solely on the pertinent primary obligation.[167] Where the primary

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162 ARSIWA (n. 5), Commentary to Article 12, para. 2; *Crawford* (n. 4), 217.
163 ARSIWA (n. 5), Commentary to Article 12, para. 6; Article 40(2); also see *Giuseppe Palmisano*, Fault, in: Wolfrum/Peters (ed.), MPEPIL, MN. 37–38.
164 ARSIWA (n. 5), Commentary to Article 12, para. 2.
165 See chapter 4, sections C and E; see *Crawford* (n. 4), 226–232.
166 *Borchard* (n. 29), 225; ARSIWA (n. 5), Article 2, para. 10; *Christian J. Tams*, All's Well that Ends Well, 62 (2002) ZaöRV 759, 766; *Crawford* (n. 4), 60–62.
167 Cf. *N.L.J.T. Horbach*, The Confusion About State Responsibility and International Liability, 4 (1991) Leiden J. Int'l L. 47, 51.

obligation does not involve such a requirement, it is only the state's objective conduct that matters for establishing a breach of the obligation.[168] Similarly, there is no distinction between 'objective' and 'subjective' elements of a breach.[169] Arguably, the concept of due diligence encompasses a subjective dimension, as a breach of due diligence always depends on individual circumstances, including the knowledge and capabilities of the state concerned.[170] Hence, due diligence will often be breached by negligent conduct by organs of the state concerned.[171] But the concept of *negligence* is not well established in international law,[172] and any failure of the state to act appropriately would rather be assessed in terms of a breach of due diligence than in terms of fault.

IV. Circumstances Precluding Wrongfulness

Although the responsibility of a state for a breach of international law does not depend on a requirement of fault, the responsibility is still precluded under certain exceptional circumstances. This applies when the affected state has given valid consent (1.), or where the state alleged to have breached its obligations has acted in lawful self-defence (2.) or applied lawful countermeasures (3.), the act occurred as a result of force majeure (4.), distress, or due to a state of necessity (5.). When a state lawfully invokes such a defence, the question arises of whether it has to make reparation for any damage suffered by the act in question (6.). Notably, no defence can be invoked for breaches of peremptory norms (or *ius cogens*), such as the prohibitions of aggression, genocide, and torture.[173]

168 ARSIWA (n. 5), Article 2, para. 10; *Crawford* (n. 4), 61.
169 ARSIWA (n. 5), Commentary to Article 2, para. 3; see *Palmisano* (n. 163), MN. 16–17.
170 Cf. *Borchard* (n. 29), 226, see chapter 4, section C.
171 Cf. *Horbach* (n. 167), 51; *Palmisano* (n. 163), MN. 16.
172 *Neil McDonald*, The Role of Due Diligence in International Law, 68 (2019) ICLQ 1041, 1044 n. 13.
173 ARSIWA (n. 5), Article 26 and commentary thereto, paras. 5–6.

1. Consent

According to Article 20 ARSIWA, the 'valid consent' of the affected state precludes the wrongfulness of an act that would otherwise constitute an internationally wrongful act.

The concept of valid consent needs to be distinguished from treaty-based *prior consent* mechanisms such as the Cartagena Protocol's AIA mechanism, where the prior agreement of the affected state not only precludes the wrongfulness of the conduct in question but renders the conduct (positively) lawful.[174] Moreover, an importing state cannot validly consent to the non-observance of the AIA mechanism, e.g. by agreeing to all imports of LMOs from a particular exporting state.[175] Because Article 14 of the Protocol provides that derogations must not result in a lower level of protection than that provided for by the Protocol, this would constitute an unlawful downward derogation from the Cartagena Protocol.[176] As discussed below, the Cartagena Protocol also does not establish a 'self-contained regime' providing its own rules on the consequences of non-compliance.[177]

2. Self-Defence

Article 21 ARSIWA provides that the wrongfulness of certain conduct is precluded if the act constitutes a lawful measure of self-defence taken in conformity with the *Charter of the United Nations*.[178] This relates to Article 51 of the Charter, which provides that every UN Member State has the right to self-defence if it faces an armed attack.[179] While this primarily refers to the prohibition of the use of force enshrined in Article 2(4) of the UN Charter, it may also justify the non-performance of certain other obligations.[180] Hence, it could be questioned whether the intentional release

174 See *Crawford* (n. 4), 288.
175 *Susanne Förster*, Internationale Haftungsregeln für schädliche Folgewirkungen gentechnisch veränderter Organismen (2007), 210–211.
176 Cf. *ibid.*
177 See *infra* section C.III.3.b).
178 Charter of the United Nations (26 June 1945; effective 21 October 1945), 1 UNTS XVI (hereinafter 'UN Charter').
179 See generally *Crawford* (n. 157), 720–725.
180 ARSIWA (n. 5), Commentary to Article 21, para. 2; *Crawford* (n. 4), 290.

and transboundary movement of self-spreading LMOs could be permitted as a lawful measure of self-defence.

However, self-defence does not justify conduct in all cases and with respect to all obligations, especially those arising from international humanitarian law or human rights.[181] As shown earlier, international law prohibits the development and use of biological weapons as well as any military use of techniques of modern biotechnology that cause widespread, long-lasting or severe effects.[182] With regard to treaties relating to the protection of the environment, the ICJ held in its *Nuclear Weapons* advisory opinion that these treaties did not intend to 'deprive a State of the exercise of its right of self-defence under international law'.[183] But the Court also pointed out that respect for the environment was one of the elements to be taken into account when assessing whether military actions adhered to the principles of necessity and proportion.[184] As these obligations specifically concern the conduct of military activities in armed conflict (*ius in bello*), their non-observance cannot be justified by the legitimate exercise of self-defence.[185]

3. Countermeasures

Article 22 ARSIWA provides that the wrongfulness of an act is precluded if and to the extent that it constitutes a countermeasure lawfully taken against another state. Countermeasures are measures that would normally contravene international obligations but are taken in response to the internationally wrongful act of another state to induce the latter to cease the wrongful act and make reparation.[186] To be justifiable, a countermeasure must meet several conditions,[187] including that it is commensurate to the injury suffered, the gravity of the breach and the rights in question.[188]

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181 ARSIWA (n. 5), Commentary to Article 21, para. 3.
182 See chapter 3, section J.
183 ICJ, Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion of 08 July 1996, ICJ Rep. 226, para. 30.
184 *Ibid.*
185 Cf. *Crawford* (n. 4), 292.
186 ARSIWA (n. 5), Article 49(1) and commentary to Part Three, chapter II, para. 1; see *infra* section B.III.
187 Cf. ICJ, Military and Paramilitary Activities in and against Nicaragua (n. 73), para. 249; ICJ, Gabčíkovo-Nagymaros (n. 138), para. 83.
188 ARSIWA (n. 5), Article 51.

Moreover, the countermeasure may only be applied as long as the other state acts in violation of international law. As soon as the responsible state has complied with the legal requirements under the law of state responsibility (i.e., cessation, non-repetition, and reparation), the countermeasure must be terminated.[189] Moreover, a countermeasure can only preclude wrongfulness in the relations between the injured state and the state which has committed the internationally wrongful act.[190]

4. Force Majeure

According to Article 23(1) ARSIWA, the wrongfulness of an otherwise wrongful act is precluded if the act is due to *force majeure*, which means an irresistible force or an unforeseen event beyond the control of the state that makes it materially impossible to perform the obligation.[191] Article 23(2) ARSIWA provides that this justification does not apply if the state invoking it caused the situation or has assumed the risk of it occurring.[192] According to the ILC's commentary to this provision, *force majeure* should not excuse performance if the state is legally required to prevent the given situation.[193] This applies to preventive obligations assumed by way of a treaty and under customary international law, such as the general obligation to prevent significant transboundary harm. Since the foreseeability of a certain risk is already taken into account when determining whether a state has breached its due diligence obligation to prevent harm, it cannot also serve as a possible justification once a breach of due diligence has been established.[194]

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189 Cf. *ibid.*, Article 53; see *infra* section B.

190 Cf. *ibid.*, Commentary to Article 22, para. 5; ICJ, Gabčíkovo-Nagymaros (n. 138), para. 48.

191 Also cf. 'force majeure' in: Black's Law Dictionary (n. 19), 788.

192 Cf. ARSIWA (n. 5), Article 23(2).

193 *Ibid.*, Commentary to Article 23, para. 10.

194 See *ibid.* It has been suggested that *force majeure* could be assumed in the context of the nuclear disaster of 2011 at *Fukushima*, where an earthquake and consequent tsunami caused a failure of the plant's cooling system, which resulted in a nuclear meltdown (see *Peel* (n. 88), 56 fn. 23). But as the risk of tsunamis was known beforehand, the disaster was not caused by an unforeseen event but rather by a 'cascade of industrial, regulatory and engineering failures' and could have been prevented if the Japanese government had followed international best practices and standards (see *Costas Synolakis/Utku Kânoğlu*, The Fukushima Accident Was Preventable, 373 (2015) Philos. Trans. R. Soc. A 20140379).

5. Necessity

Article 25 ARSIWA provides that the wrongfulness of an otherwise wrongful act can be precluded by 'necessity', which refers to situations where the only means by which a state can protect an essential interest from a grave and imminent peril is by not complying with an international obligation that protects a less important interest.[195] Unlike *force majeure*, where there is 'no element of free choice',[196] necessity involves a choice by the state to act inconsistently with an international obligation in order to protect another interest.[197] According to Article 25(1) ARSIWA, a plea of necessity is contingent upon four requirements: There must be (1) an 'essential interest' which is (2) threatened by a 'grave and imminent peril', and the act in question must be (3) the 'only way' to safeguard this interest. Moreover, (4) the act must not seriously impair an essential interest of the state(s) towards the obligation is owed.

As to the *first* requirement, the extent to which a certain interest is 'essential' depends on all relevant circumstances.[198] Besides the economic survival of the state and the safety of civilians, one of the interests most frequently invoked by states is the preservation of the environment.[199] In 1980, the ILC suggested that 'safeguarding the ecological balance has come to be considered an "essential interest" of all States'.[200] This was confirmed in 1997 in the case of the *Gabčíkovo-Nagymaros Project*, which concerned the suspension and subsequent abandonment of a joint barrage project in the river *Danube* between Hungary and Czechoslovakia (later Slovakia).[201] In this case, the ICJ ruled that a state's concern for its natural environment can constitute an essential interest within the meaning of what is now codified in Article 25 ARSIWA.[202] This also extends to the protection of

195 *Sarah Heathcote*, Circumstances Precluding Wrongfulness in the ILC Articles on State Responsibility: Necessity, in: James Crawford/Alain Pellet/Simon Olleson (eds.), The Law of International Responsibility (2010) 491, 491.
196 ARSIWA (n. 5), Commentary to Article 23, para. 1.
197 *Ibid.*, Commentary to Article 25, para. 2; *Crawford* (n. 4), 307.
198 ARSIWA (n. 5), Commentary to Article 25, para. 15; *Crawford* (n. 4), 308.
199 *Heathcote* (n. 195), 496–497; *Crawford* (n. 4), 308–309; also see the cases discussed in ARSIWA (n. 5), Commentary to Article 25, paras. 6, 9, 11, and 12; and, more recently ICJ, Certain Activities/Construction of a Road (Merits) (n. 160), paras. 158–159.
200 ILC, Report of the Commission to the General Assembly on the Work of Its Thirty-Second Session, YBILC 1980, vol. II(2) (1981), p. 39, para. 14.
201 For the background of the case, see *Sands* et al. (n. 108), 345–347.
202 ICJ, Gabčíkovo-Nagymaros (n. 138), para. 53.

species threatened with extinction.[203] For instance, the *Fisheries Jurisdiction* case of 1998 concerned the seizure of a Spanish fishing ship by Canada, which argued that its conduct was 'necessary' to prevent overfishing of the Greenland halibut.[204] This could also apply to LMO techniques used to control invasive or protect endangered species.

The *second* element of necessity is that the essential interest must be threatened by a 'grave and imminent peril'.[205] The term 'peril' implies that the essential interest must be at risk and has not already perished.[206] In the view of the ILC, the peril has to be objectively established and not merely apprehended as possible.[207] Besides being grave, the peril must also be 'imminent' in the sense of 'proximate'.[208] But in *Gabčíkovo-Nagymaros*, the ICJ held that

> *'a "peril" appearing in the long term might be held to be "imminent" as soon as it is established […] that the realization of that peril, however far off it might be, is not thereby any less certain and inevitable'*.[209]

Hence, the criterion of imminence does not require that the damage occur immediately but that immediate action is required to break the causal chain that would otherwise lead to damage to the interest in question.[210] At the same time, the peril must be 'objectively established and not merely apprehended as possible'.[211] This could be interpreted as excluding situations in which the risk cannot be established without doubt due to scientific uncertainties.[212] But the ILC stated in its commentary that a degree of uncertainty about the future does not necessarily disqualify a state from invoking necessity if the peril is 'clearly established on the basis of the evidence reasonably available at the time'.[213] Hence, it does not seem to be

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203 Cf. *Crawford* (n. 4), 308–309.
204 ICJ, Fisheries Jurisdiction (Spain v. Canada), Jurisdiction of the Court, Judgment of 04 December 1998, ICJ Rep. 432, para. 20; cf. ARSIWA (n. 5), Commentary to Article 25, para. 12.
205 *Ibid.*, Article 25(1)(a).
206 *Heathcote* (n. 195), 497; ARSIWA (n. 5), Commentary to Article 25, para. 16; see ICJ, Gabčíkovo-Nagymaros (n. 138), para. 54.
207 ARSIWA (n. 5), Article 25, para. 15.
208 *Ibid.*, Commentary to Article 25, para. 15.
209 ICJ, Gabčíkovo-Nagymaros (n. 138), para. 54.
210 Cf. *Heathcote* (n. 195), 497.
211 ICJ, Gabčíkovo-Nagymaros (n. 138), para. 54; ARSIWA (n. 5), Commentary to Article 25, para. 15.
212 Cf. *Heathcote* (n. 195), 497.
213 ARSIWA (n. 5), Commentary to Article 25, para. 16.

generally impossible to rely on the precautionary principle when invoking necessity,[214] although the ICJ's jurisprudence indicates that the judicial scrutiny in such a case would be more rigid than in other situations.[215]

The *third* element of necessity requires that the course of action implemented by the state is the 'only way' to safeguard the interest at stake.[216] The plea of necessity is excluded whenever there are other (otherwise lawful) means available, even if they are more costly or less convenient or require cooperation with other states.[217] The question of available alternative means could be particularly controversial in the context of self-spreading LMOs, especially when their deployment is proposed as a more efficient way to address an issue for which conventional means already exist. Moreover, any conduct going beyond what is strictly necessary for safeguarding the threatened interest is not covered by the plea of necessity.[218]

The *fourth* condition for a plea of necessity is that the act in question must not seriously impair an essential interest of the state(s) towards which the obligation exists or the international community as a whole.[219] This implies that the interest sought to be safeguarded must, from an objective point of view, outweigh all other interests of the state(s) affected by the measure.[220]

While the conditions for necessity discussed until now require a balancing of interests, there are two exceptions in which necessity may in no case be invoked. According to Article 25(2)(a) ARSIWA, the justification cannot be invoked when the international obligation in question excludes the possibility of invoking necessity. Such an exclusion can be made explicitly or implicitly, either because the primary norm leaves no room for the invoking necessity or because it provides a *lex specialis* rule on derogation in abnormal situations like most human rights instruments do.[221]

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214 *Heathcote* (n. 195), 497–498; *Crawford* (n. 4), 311; on the precautionary principle in general, see chapter 4, section B.VI.

215 Cf. ICJ, Gabčíkovo-Nagymaros (n. 138), para. 54; ICJ, Certain Activities/Construction of a Road (Merits) (n. 160), paras. 158–159.

216 ARSIWA (n. 5), Article 25(1)(a).

217 *Ibid.*, Commentary to Article 25, para. 15; *Crawford* (n. 4), 311; see ICJ, Gabčíkovo-Nagymaros (n. 138), para. 55; ICJ, Construction of a Wall (n. 91), para. 142.

218 ARSIWA (n. 5), Commentary to Article 25, para. 15.

219 *Ibid.*, Article 25(1)(b).

220 *Ibid.*, Commentary to Article 25, para. 17; *Heathcote* (n. 195), 498.

221 *Heathcote* (n. 195), 498; see ARSIWA (n. 5), Commentary to Article 25, para. 19; ICJ, Construction of a Wall (n. 91), paras. 136–137.

Moreover, Article 25(2)(b) ARSIWA provides that necessity may not be relied upon if the responsible state has contributed to the situation of necessity. According to the ILC's commentary, such a contribution must be 'sufficiently substantial and not merely incidental or peripheral'.[222] In the *Gabčíkovo-Nagymaros* case, the ICJ held that even if Hungary had been able to establish a state of necessity (which it was not), it could not have relied on necessity as a justification since it had contributed to the situation which now threatened its interests.[223] Similar scenarios are conceivable in the context of the present study. If, for example, a state has approved the release of a gene drive that spreads uncontrollably across borders, it may be barred from invoking necessity for releasing a second gene drive in an attempt to 'reverse' the former. But against this background, it is questionable whether it is reasonable to generally exclude the plea of necessity because it runs the risk of producing 'absurd results' by barring action that could help mitigate the situation.[224]

6. Reparation in the Event of a Circumstance Precluding Wrongfulness

Article 27(b) ARSIWA provides that the invocation of a circumstance precluding wrongfulness shall be without prejudice to 'the question of compensation for any material loss caused by the act in question'. The term 'material loss' is narrower than the concept of damage applied elsewhere in the ARSIWA[225] and seems to exclude moral damage.[226] Moreover, the ILC's commentary notes that 'compensation' is not limited to monetary compensation in the sense of the ARSIWA's framework for reparation.[227] The commentary also emphasizes that Article 27(b) ARSIWA 'is a proper condition, in certain cases, for allowing a State to rely on a circumstance precluding wrongfulness'.[228] This suggests that there is indeed a legal obli-

222 ARSIWA (n. 5), Commentary to Article 25, para. 20.
223 ICJ, Gabčíkovo-Nagymaros (n. 138), para. 57.
224 Cf. *Heathcote* (n. 195), 499.
225 ARSIWA (n. 5), Commentary to Article 27, para. 4.
226 *Crawford* (n. 4), 318.
227 ARSIWA (n. 5), Commentary to Article 27, para. 4; see *Crawford* (n. 4), 318 and *infra* section B.II.
228 ARSIWA (n. 5), Commentary to Article 257, para. 5; also see ICJ, Gabčíkovo-Nagymaros (n. 138), para. 48, noting that Hungary had expressly acknowledged that its invocation of a state of necessity would not exempt it from its duty to compensate its partner.

gation to make reparation for damage suffered from an act the wrongfulness of which is precluded – a finding which is not self-evident considering that, under the law of state responsibility, the obligation to make reparation follows from the wrongfulness of the act.[229] However, the ARSIWA do neither specify the legal grounds for such compensation nor in which cases compensation is required.[230]

With regard to the legal basis of an obligation to make reparation for damage caused by acts of which the wrongfulness is precluded, two possible approaches have been discussed. The first approach is to assume the existence of responsibility without any wrongful act, which has been discussed intermittently by the ILC as 'liability for lawful acts'.[231] However, as shown below, there is no (strict) liability of states for harm caused by activities not prohibited by international law.[232] Another approach is to apply the normal rules on reparation contained in the ARSIWA.[233] According to this view, reparation in these cases falls within the scope of the secondary rules of responsibility because it concerns situations where state responsibility arises *prima facie* and is excluded only subsequently due to a circumstance precluding the wrongfulness.[234] This appears to be in line with the ICJ's position in *Gabčíkovo-Nagymaros*, where the court assumed that the existence of a circumstance precluding wrongfulness did not mean that a state had acted in accordance with its obligations or that these obligations had ceased to be binding upon it.[235] As indicated by Article 27(b) ARSIWA, the regime on circumstances precluding wrongfulness is premised on the understanding that a preclusion of wrongfulness does not release the state from its obligation to make reparation. In any event, whether this obligation is seen as a substitute for the primary obligation that cannot be met, or attached as a legal consequence to the preclusion of wrongfulness,[236] appears to be a rather theoretical question.

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229 Cf. *Mathias Forteau*, Reparation in the Event of a Circumstance Precluding Wrongfulness, in: James Crawford/Alain Pellet/Simon Olleson (eds.), The Law of International Responsibility (2010) 887, 888–889.

230 Cf. ARSIWA (n. 5), para. 5; *Forteau* (n. 229), 888.

231 Cf. *S. P. Jagota*, State Responsibility: Circumstances Precluding Wrongfulness, 16 (1985) NYL 249, 274; *Horbach* (n. 167), 59; *Forteau* (n. 229), 890.

232 See chapter 10.

233 *Forteau* (n. 229), 890–891.

234 *James Crawford*, Second Report on State Responsibility, UN Doc. A/CN. 4/498 (1999), para. 341.

235 ICJ, Gabčíkovo-Nagymaros (n. 138), para. 48.

236 Cf. the discussion by *Forteau* (n. 229), 891–892.

A more relevant question relates to which categories of circumstances precluding wrongfulness give rise to an obligation to make reparation. In the case of *necessity*, which leaves the acting state a choice (in theory at least) as to whether to act inconsistently with its international obligation, the duty to compensate is widely recognized.[237] Conversely, reparation is not owed for lawful *countermeasures* or *self-defence*, because those circumstances depend on a prior wrongful conduct of the 'target' state.[238] *Consent* by the affected state(s) equates to a waiver of the respective right and thus can be made contingent upon an agreement on any question of compensation that may arise.

However, it is doubtful whether reparation is due in cases of *force majeure*, since the state relying on this justification has, by definition, not contributed to the situation and therefore is 'no more responsible for any material loss than the state suffering it'.[239] Situations of self-defence and countermeasures when the victim is a third party raise similar issues. However, since the acting state is still the ultimate perpetrator of the injury, it appears justifiable to assume that it shall bear the consequences of its conduct suffered by other states.[240] In any event, the commentary to Article 27 ARSIWA indicates that it would be for the state invoking a circumstance precluding wrongfulness to agree with any affected states on the possibility and extent of compensation payable in a given case.[241]

B. Legal Consequences of International Responsibility

The previous section has shown that the international responsibility of a state arises for conduct that is attributable to the state and that is not in conformity with its international obligations, provided that no valid defence can be invoked. Once a state's international responsibility is established under these conditions, the question about the content of that responsibility arises.

It is generally assumed that a breach of a 'primary' obligation of international law leads to the emergence of 'secondary' obligations, which denote

237 Cf. *Crawford* (n. 4), 318–319; *Forteau* (n. 229), 892; ICJ, Gabčíkovo-Nagymaros (n. 138), para. 48.
238 *Crawford* (n. 4), 319.
239 *Ibid.*
240 Cf. *Forteau* (n. 229), 893.
241 *Crawford* (n. 4), Commentary to Article 27, para. 6.

the legal consequences of breaches of primary obligations.[242] In particular, the responsible state is under an obligation to cease the wrongful conduct and to offer appropriate assurances and guarantees of non-repetitions, where appropriate (I.), and obliged to make full reparation for any caused by the internationally wrongful act (II.). Moreover, state responsibility offers the injured state the right to take countermeasures (III.).

I. Obligations of Cessation and Non-Repetition

Article 29 ARSIWA stipulates that the occurrence of a breach does not relieve the responsible state from its continuing duty to perform the obligation breached. This is mirrored by Article 60 of the *Vienna Convention on the Law of Treaties* (VCLT),[243] which provides that a material breach of a treaty does not void the treaty, but rather entitles the injured state(s) to suspend or terminate the treaty.[244]

As a corollary of the continued duty of performance, Article 30(a) ARSIWA provides that the responsible state is required to cease that act if it is continuing.[245] In the context of the present study, this means that whenever an activity that causes transboundary harm (such as an ongoing unlawful release of LMOs) is attributable to a state,[246] the state is required to immediately terminate that activity.[247] However, in situations where the harmful activity is not directly attributable to the state, the legal consequences may be more difficult to identify. In these situations, the breach consists of the state's failure to adequately regulate and control the hazardous activity in question. Hence, the state cannot terminate the activity itself but must require the private operator to do so. However, that private actor may possess a valid authorization for his activity, which cannot be

242 ARSIWA (n. 5), General commentary, para. 1; *Tams* (n. 166), 764.
243 Vienna Convention on the Law of Treaties (23 May 1969; effective 27 January 1980), 1155 UNTS 331 (hereinafter 'VCLT').
244 Cf. ARSIWA (n. 5), Article 29, para. 3.
245 Cf. ICJ, Construction of a Wall (n. 91), paras. 150–151; ICJ, Jurisdictional Immunities of the State (Germany v. Italy: Greece intervening), Judgment of 03 February 2012, ICJ Rep. 99, para. 137. On the (rather academic) question of the distinction between cessation and the continued duty of performance, see *Crawford* (n. 4), 464–465.
246 See *supra* section A.II.
247 *Lefeber* (n. 105), 129.

repealed without taking due account of the actor's legal rights.[248] In these instances, it may be justified to allow the responsible state a reasonable amount of time to arrange for the relevant activity to be terminated or modified.[249] However, such a 'grace period' is without prejudice to the obligation of the responsible state to make reparation for any harm caused during this transitional period.[250] Moreover, although injured states have sometimes offered to share the financial burden of modifying or terminating a harmful activity with the source state, there is no legal obligation to do so.[251]

According to Article 30(b) ARSIWA, the responsible state must offer 'appropriate assurances and guarantees of non-repetition, if circumstances so require'. Assurances and guarantees of non-repetition are commonly sought when the injured state has reasons to believe that merely returning to the pre-existing situation by cessation and reparation of the injury does not satisfactorily protect it from future infringements.[252] They may be required, for example, when there are indications that deliberate unlawful releases of LMOs by the responsible state or actors under its jurisdiction are likely to occur again in the future.

II. Obligation to Make Full Reparation

The most important and far-reaching consequence of state responsibility is the responsible state's obligation to make reparation for the injury caused by the wrongful act. The most prominent statement of this principle was made in 1927 by the *Permanent Court of International Justice* (PCIJ) in the *Chorzów Factory* case, where the Court held that it was 'a principle of international law that the breach of an engagement involves an obligation to make reparation in an adequate form'.[253] Addressing the content of this obligation, the PCIJ held in a subsequent judgment on the same dispute that

248 *Ibid.*, 130; cf. Trail Smelter Case (United States v. Canada), Decision of 11 March 1941, III RIAA 1938, 1966.
249 *Lefeber* (n. 105), 130.
250 *Ibid.*; see *infra* section B.II.
251 *Lefeber* (n. 105), 130–132.
252 ARSIWA (n. 5), Commentary to Article 30, para. 9; see *Crawford* (n. 4), 469–479.
253 PCIJ, Factory at Chorzów (Germany v. Poland), Judgment on Jurisdiction of 26 July 1927, PCIJ Rep. Ser. A, No. 9, 21.

> *'reparation must, as far as possible, wipe out all the consequences of the illegal act and reestablish the situation which would, in all probability, have existed if that act had not been committed'.*[254]

This definition emphasizes two core principles of reparation, namely that of 'full reparation', which provides that all consequences of the unlawful act shall be wiped out, and the principle that reparation shall aim at re-establishing the *status quo ante*. The customary status of this obligation has been confirmed in international case law on numerous occasions.[255]

The ILC's Articles on State Responsibility provide that the state responsible for an internationally wrongful act is under an obligation to make 'full reparation for the injury caused by the internally wrongful act'.[256] Reparation includes both material and moral damage (1.), provided that there is a causal link between the wrongful conduct and the injury (2.). Depending on the circumstances, full reparation shall take the form of reparation, compensation, satisfaction, or a combination of these forms (3.). However, the obligation to make reparation may be reduced in situations where the injured state has contributed to the injury or failed to mitigate damage after it occurred (4.).

1. Recoverable Injury

Article 31(2) ARSIWA provides that the notion of injury for which full reparation shall be made 'includes any damage, whether material or moral, caused by the internationally wrongful act of a State'. In its commentary, the ILC explained that this formulation was to be understood 'both as inclusive, covering both material and moral damage broadly understood, and limitative, excluding merely abstract concerns or general interests of a State which is individually unaffected by the breach'.[257]

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254 PCIJ, Factory at Chorzów (Germany v. Poland), Merits Judgment of 13 September 1928, PCJI Rep. Ser. A, No. 17, 47.

255 See, e.g., ICJ, Bosnian Genocide (n. 8), para. 460; ICJ, Construction of a Wall (n. 91), para. 152; ICJ, Ahmadou Sadio Diallo (Republic of Guinea v. Democratic Republic of the Congo), Merits Judgment of 30 November 2010, ICJ Rep. 639, para. 161; ICJ, United States Diplomatic and Consular Staff in Tehran (n. 137); for further references, see *Crawford* (n. 4), 481.

256 ARSIWA (n. 5), Article 31(1).

257 *Ibid.*, Commentary to Article 31, para. 5.

The notion of 'material' damage refers to damage to property or other interests which is assessable in financial terms. In contrast, 'moral' damage embodies two distinct concepts: On the one hand, it refers to moral damage *to individuals*, which includes things such as individual pain and suffering, loss of loved ones or intrusion in one's home or private life.[258] Like material damage, moral damage suffered by individuals is often repaired by the payment of monetary compensation.[259] On the other hand, moral damage *to a state* is the 'non-material injury' caused by a violation of rights of that state, such as its territorial integrity.[260] In some cases, this may also include the 'legal injury' arising from the mere fact that an international obligation has been breached.[261]

2. Causation

In order to be subject to reparation, damage must be 'caused' by the wrongful act, which means that there must be a causal link between the wrongful conduct and the injury.[262] For the causal link to be properly established, the wrongful act must be a necessary condition (or *conditio sine qua non*) of the harm, without which the harm would not have occurred.[263]

However, the sole reliance on a factual link can lead to liability being too wide.[264] For this reason, it is generally accepted that factual causality is a necessary but insufficient condition for reparation.[265] In addition, there must be a degree of proximity between the wrongful act and the injury.[266] According to the ICJ's settled case law, establishing a causal link requires to determine

> '*whether there is a sufficiently direct and certain causal nexus between the wrongful act […] and the injury suffered by the Applicant*'.[267]

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258 *Ibid.*, Commentary to Article 31, para. 5.
259 See *infra* section B.II.3.b)aa).
260 ARSIWA (n. 5), Commentary to Article 37, para. 3–4.
261 See *Crawford* (n. 4), 487–491.
262 ARSIWA (n. 5), Article 31(2) and commentary thereto, para. 9.
263 *Lefeber* (n. 105), 89.
264 *Ibid.*, 92.
265 ARSIWA (n. 5), Commentary to Article 31, para. 10, see *Crawford* (n. 4), 492.
266 *Lefeber* (n. 105), 92.
267 Cf. ICJ, Bosnian Genocide (n. 8), para. 462; ICJ, Ahmadou Sadio Diallo (Republic of Guinea v. Democratic Republic of the Congo), Judgment on Compensa-

In the view of the ILC, the establishment of a causal link requires that the injury is not 'too remote' or 'consequential' from the wrongful act.[268] In other words, the wrongful act must be a 'proximate cause' of the resulting injury.[269] However, the ILC noted that there is no 'single verbal formula' to describe the link which must exist between the wrongful act and the injury.[270] Instead, the ILC held that several factors could be relevant, including the foreseeability or proximity of the damage and whether the harm caused was 'within the ambit of the rule which was breached',[271] i.e. whether the purpose of the rule was to avoid the harm that occurred. Moreover, there must be no supervening acts that broke the chain of causation.[272] On the other hand, it has been argued that the chain of causation shall not be considered interrupted by lawful intervening measures if these measures are reasonable in light of the circumstances of the case.[273]

After all, the acceptable length of a causal chain can only be determined on a case-by-case basis.[274] Yet, special questions arise about the causation of environmental damage (a)). Moreover, there is a general requirement that the harm must be within the ambit of the rules breached (b)). The attribution of responsibility may also entail difficulties when concurrent causes or multiple actors contributed to the damage (c)).

a) Proof of Causality for Environmental Damage

Proving a causal link may be prone to particular difficulties in cases of environmental damage, especially when LMOs are involved.[275] These diffi-

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tion of 19 June 2012, ICJ Rep. 324, para. 14; ICJ, Certain Activities Carried out by Nicaragua in the Border Area (Costa Rica v. Nicaragua), Compensation Owed by Nicaragua to Costa Rica, Judgment of 02 February 2018, ICJ Rep. 15, para. 32.

268 ARSIWA (n. 5), Commentary to Article 31, para. 10.

269 *Lefeber* (n. 105), 92; *Bergkamp* (n. 23), 285–286.

270 ARSIWA (n. 5), Commentary to Article 31, para. 10.

271 *Ibid.*

272 UNCC, Report and Recommendations Made by the Panel of Commissioners Concerning Part One of the Fourth Instalment of "F4" Claims, UN Doc. S/AC.26/2004/16 (2004), para. 48; similarly UNCC, Report and Recommendations Made by the Panel of Commissioners Concerning the Fifth Instalment of "F4" Claims, UN Doc. S/AC.26/2005/10 (2005), para. 56.

273 *Lefeber* (n. 105), 97–98; see chapter 11, section A.II.1.

274 *Lefeber* (n. 105), 98.

275 Cf. *ibid.*, 32–33.

culties may result, for instance, from the fact that there is no scientific evidence that a certain activity or LMO is in fact capable of causing the damage in question[276] or when the damage cannot be attributed to one of several possible causes.[277] Lapse of time may also be a factor causing difficulties in establishing causation, as the adverse effects of an LMO may appear only months or even years after being released.[278] For these reasons, it is questionable whether the criteria for proving causation should be modified in cases involving damage to the environment.

In legal scholarship, some authors have proposed to lower the evidentiary threshold for the proof of causation for environmental damage.[279] In its resolution on liability for environmental damage of 1997, the *Institut de Droit International* proposed to establish 'presumptions of causality' in relation to hazardous activities and cumulative or long-standing damages that are not attributable to a single entity but a certain sector or type of activity.[280] However, such presumptions of causality appear not yet to be established in international case law. With regard to Article 139(2) UNCLOS,[281] which provides for liability of states sponsoring mining activities in the international seabed area, the *Seabed Disputes Chamber* of the *International Tribunal for the Law of the Sea* held that liability requires a causal link between the sponsoring state's failure to adequately regulate

276 Cf. ICJ, Certain Activities (Compensation) (n. 267), para. 34.

277 Cf. *Ruth Mackenzie*, Environmental Damage and Genetically Modified Organisms, in: Michael Bowman/Alan E. Boyle (eds.), Environmental Damage in International and Comparative Law (2002) 63, 71; *Förster* (n. 175), 274–275; *Gurdial S. Nijar* et al., Liability & Redress Under the Cartagena Protocol on Biosafety (2008), 144–145; *Odile J. Lim Tung*, Genetically Modified Organisms and Transboundary Damage, 38 (2013) SAYIL 67, 81–82; *Daniela M. Schmitt*, Staatenverantwortlichkeit für Schäden an der biologischen Vielfalt (2018), 399.

278 Cf. *Reynaldo A. Alvarez-Morales*, A Scientific Perspective on the Supplementary Protocol, in: Akiho Shibata (ed.), International Liability Regime for Biodiversity Damage (2014) 105, 107.

279 Cf. generally *Bergkamp* (n. 23), 287–291 with further references. In the context of transboundary air pollution, see *Phoebe N. Okowa*, State Responsibility for Transboundary Air Pollution in International Law (2000), 187; on climate change, see *Roda Verheyen*, Climate Change Damage and International Law (2005), 257–263; with respect to damage resulting from LMOs, see *Förster* (n. 175), 275–280; on damage to biodiversity, see *Schmitt* (n. 277), 403.

280 IDI, Resolution on Responsibility and Liability for Environmental Damage (n. 161), Article 7.

281 Article 139(2) UNCLOS provides, *inter alia*, that 'damage caused by the failure of a State Party or international organization to carry out its responsibilities under this Part shall entail liability'.

the activity and the occurrence of damage, and that such a link cannot be presumed.[282] Similarly, in the *Pulp Mills* case, the ICJ required 'clear evidence' to establish a link between the damage and its alleged cause.[283] In the view of the ICJ, the risk of environmental harm did not lead to a lowered standard of proof for the establishment of a causal link.[284]

The *Pulp Mills* case also shows that the problems involved in establishing causation cannot be overcome by relying on the precautionary principle. As shown above, the precautionary principle provides that lack of full scientific certainty shall not be used as a reason not to take action to avoid serious or irreversible damage to the environment.[285] While the precautionary principle mandates preventive action in situations of scientific uncertainty about the cause-and-effect relationship, it cannot be relied upon to establish liability for harm that has already occurred.[286] Thus, although non-observance of the precautionary principle might give rise to international responsibility, it cannot be relied upon to overcome evidentiary issues in establishing that damage has been caused by a particular conduct. This was also confirmed by the ICJ, which concluded that the precautionary principle does not operate as a reversal of the burden of proof in situations where the claimant state is unable to bring scientific proof of the damage and its cause.[287]

A closely related issue concerns the foreseeability of the damage. According to an older doctrine in scholarship and international case law, the establishment of a causal link requires that the source state foresaw – or could have foreseen – the occurrence and extent of harm at the time when it engaged in the relevant unlawful conduct.[288] Consequently, liability

282 ITLOS, Responsibilities and Obligations of States (n. 141), paras. 182–184. See *Vöneky/Höfelmeier*, Article 139 UNCLOS (n. 141), MN. 15.

283 ICJ, Pulp Mills on the River Uruguay (Argentina v. Uruguay), Judgment of 20 April 2010, ICJ Rep. 14, para. 257.

284 *Daniel Kazhdan*, Precautionary Pulp: Pulp Mills and the Evolving Dispute Between International Tribunals over the Reach of the Precautionary Principle, 38 (2011) ELQ 527, 546.

285 Rio Declaration on Environment and Development (14 June 1992), UN Doc. A/CONF.151/26/Rev.1 (Vol. I), Principle 15; see chapter 4, section B.VI.

286 *Lefeber* (n. 105), 91.

287 ICJ, Pulp Mills (n. 283), para. 164.

288 Cf. *Gaetano Arangio-Ruiz*, Second Report on State Responsibility, YBILC 1989 Vol. II Pt. 1, 1, paras. 38–40; *Bergkamp* (n. 23), 292–294; in international case law, see e.g., Lighthouses Arbitration between France and Greece, Claims 19 and 21, 23 ILR 353, 353; Samoan Claims (Germany, Great Britain, United States), Decision Given by Oscar II, King of Sweden and Norway of 14 October

would be limited to the extent that harm was objectively foreseeable.[289] However, all cases in which the element of foreseeability was relied upon occurred at a time when fault was still considered a necessary element of an internationally wrongful act.[290] Today, the aspect of foreseeability is incorporated in the obligation to exercise *due diligence* to avoid transboundary damage, and the foreseeability and extent of harm are elements in establishing a violation of this obligation.[291] In this vein, the precautionary principle might require action even when damage is not objectively foreseeable. However, the foreseeability of harm no longer affects the establishment of a causal link.[292]

In its judgment on compensation in the *Certain Activities* case between Costa Rica and Nicaragua, the ICJ expressly recognized that '[i]n cases of alleged environmental damage, particular issues may arise with respect to the existence of damage and causation'.[293] In the Court's view, these issues may result from the damage being caused by several concurrent causes or scientific uncertainties about the alleged cause-and-effect relationship.[294] However, the Court refused to formulate general principles on how these challenges shall be dealt with. Instead, it held that they 'must be addressed as and when they arise in light of the facts of the case at hand and the evidence presented to the Court'.[295] In the view of the Court, problems in establishing a causal link in cases of environmental damage should be taken into account in the judicial appreciation of the facts:

> *'Ultimately, it is for the Court to decide whether there is a sufficient causal nexus between the wrongful act and the injury suffered.'*[296]

1902, IX RIAA 15, 26; Anglo-Italian Conciliation Commission, Currie Case – Decision No. 21, 13 March 1954, XIV RIAA 19, 24; see *Lefeber* (n. 105), 95–96.

289 Cf. Naulilaa Arbitration (Portugal v. Germany), Responsabilité de l'Allemagne à raison des dommages causés dans les colonies portugaises du sud de l'Afrique (sentence sur le principe de la responsabilité) of 31 July 1928, II RIAA 1011, 1031; see *Johan G. Lammers*, Pollution of International Watercourses (1984), 602 (providing a translation of the relevant passages).

290 *Lefeber* (n. 105), 96. Note that foreseeability is still named as a possible criterion in ARSIWA (n. 5), Article 31, para. 10.

291 *Lefeber* (n. 105), 96; see *supra* section A.III.3, and chapter 4, sections B.IV. and B.VI.

292 *Ibid.*

293 ICJ, Certain Activities (Compensation) (n. 267), para. 34.

294 *Ibid.*

295 *Ibid.*

296 *Ibid.*

In sum, the requirements for proving a causal link between an internationally wrongful act and the occurrence of environmental damage are not different to those that apply to other types of damage. Under current international law, a mere probable cause is not a sufficient basis to require a responsible state to make reparation. Lowering the evidentiary threshold for establishing causal links in cases of environmental damage remains a proposal that is yet to be adopted by international legal practice.[297] However, the recent case law of the ICJ suggests that evidentiary problems should be duly considered by the judges when determining whether there is a sufficient causal link between the wrongful act and the damage.

b) Harm Within the Ambit of the Rule Breached

According to the ILC, another factor for determining whether a sufficient causal link exists between the breach of an international obligation and the occurrence of harm is whether the harm caused was 'within the ambit of the rule which was breached, having regard to the purpose of that rule'.[298] In other words, the purpose of the obligation breached must – at least indirectly – cover the avoidance of the type of harm in question.

In the context of the present study, this means that a breach of an obligation that serves to protect biological diversity – namely, the CBD and the Cartagena Protocol – does not necessarily entail the responsibility to make reparation for damage that is not related to biodiversity, such as property damage or economic losses, unless it is a direct consequence of damage to biodiversity caused by the wrongful act. This appears to be in line with the general rule that the establishment of causation not only requires a factual link, but also that the breach is a 'proximate cause' for the damage sustained.[299]

c) Concurrent Causes of Damage and 'Shared Responsibility'

Another issue relating to causation concerns cases in which damage is caused by a combination of two or more factors referred to as 'concurrent'

297 See chapter 6, section C.III.
298 ARSIWA (n. 5), Commentary to Article 31, para. 10.
299 See *supra* section B.II.2.

or 'concomitant' causes of damage.[300] There may also be cases in which damage is not caused by a single actor, but where multiple actors contribute to a single harmful outcome. In legal scholarship, this problem is discussed as cases of 'shared responsibility'.[301]

Scenarios of shared responsibility can be broadly divided into two categories: 'Horizontal' shared responsibility denotes situations in which a plurality of states are jointly responsible for the same instance of harm.[302] The second category, which is called 'vertical' shared responsibility, refers to situations in which not only states but also private actors or international organizations contributed to the damage.[303] In all of these situations, it is questionable whether – and to what extent – an individual state can be held liable.

According to the ILC's commentary to the ARSIWA, unless some part of the injury can be distinguished as not being caused by the responsible state, the latter shall be held responsible for all the consequences of its wrongful conduct, provided they are not 'too remote'.[304] The environmental panel of the *United Nations Compensation Commission* (UNCC)[305] did not follow this approach but awarded partial compensation where the evidence allowed it to determine the portion of the damage directly caused by Iraq's actions.[306] Where the data submitted by the claimants did not allow to determine the proportion of the loss attributable to Iraq, the

300 *Philippe Gautier*, Environmental Damage and the United Nations Claims Commission: New Directions for Future International Environmental Cases?, in: Tafsir M. Ndiaye/Rüdiger Wolfrum (eds.), Law of the Sea, Environmental Law, and Settlement of Disputes (2010) 177, 196.

301 *André Nollkaemper/Dov Jacobs*, Shared Responsibility in International Law: A Conceptual Framework, 34 (2013) Mich. J. Int'l L. 359.

302 *Ilias Plakokefalos*, Liability for Transboundary Harm, in: André Nollkaemper/Ilias Plakokefalos et al. (eds.), The Practice of Shared Responsibility in International Law (2017) 1051, 1052.

303 *Ibid.*, 1053.

304 ARSIWA (n. 5), Commentary to Article 31, para. 13.

305 The United Nations Compensation was established by the United Nations Security Council to implement the liability of Iraq for its unlawful invasion and occupation of Kuwait in 1990 and 1991. The environmental panel was a dedicated panel of commissioners tasked with assessing claims for compensation for damage to the environment. For details, see chapter 11, section B.I.3.

306 UNCC, Report and Recommendations Made by the Panel of Commissioners Concerning the Third Instalment of "F4" Claims, UN Doc. S/AC.26/2003/31 (2003), para. 39.

claims were rejected.[307] Nevertheless, the UNCC granted compensation when Iraq's actions were the 'predominant cause' of the damage.[308]

It appears that there has never been a case in which a shared responsibility of multiple states was invoked before an international court or tribunal. Such a claim would raise not only difficult legal and evidentiary questions but also jurisdictional problems if not all states involved can be brought before a single international adjudicator.[309] In any event, shared claims against states and private actors are likely to be brought in different fora.[310]

3. Forms of Reparation

In the *Chorzów Factory* case mentioned before, the PCIJ specified the content of the obligation to make reparation for an internationally wrongful act. It stated that

> *'reparation must, as far as possible, wipe out all the consequences of the illegal act and reestablish the situation which would, in all probability, have existed if that act had not been committed'.*[311]

In order to achieve full reparation, international law has come to distinguish three forms of reparation, namely restitution (a)), compensation (b)), and satisfaction (c)).[312] Depending on the type and extent of the injury, wiping out the consequences of a wrongful act may require some or all forms of reparation.[313]

a) Restitution

The primary form of reparation is *restitution*, which denotes the re-establishment of the situation that existed before the wrongful act was commit-

307 UNCC Panel Report F4/4.1 (2004) (n. 272), para. 40. Cf., e.g., UNCC Panel Report F4/5 (2005) (n. 272), para. 322, where the panel rejected a claim for salinization of groundwater due to insufficient evidence of causation.
308 *Ibid.*, para. 629; see *Gautier* (n. 300), 197–198.
309 *Peel* (n. 88), 62.
310 See *André Nollkaemper*, Procedural Aspects of Shared Responsibility in International Adjudication, 4 (2013) Journal of International Dispute Settlement 277.
311 PCIJ, Factory at Chorzów (Germany v. Poland) (n. 254), 47.
312 See ARSIWA (n. 5), Article 34–37; *Crawford* (n. 4), 507–508.
313 ARSIWA (n. 5), Commentary to Article 34, para. 2.

ted.[314] This encompasses any action that needs to be taken by the responsible state in order to restore the situation resulting from its internationally wrongful act.[315] Usually, restoration takes place either in the form of *legal restitution*, e.g. by revoking an LMO release permit granted in violation of international law, or in the form of *material restitution*, such as the restitution of property[316] or clean-up and restoration measures taken in response to environmental harm.[317]

aa) Objective of Restitution

An important conceptual question is whether restitution is aimed at restoring the situation that existed before the wrongful act was committed (i.e. the *status quo ante*[318]) or at establishing the situation that would have, had the wrongful act not been committed, most probably existed at the time when restitution is served.

The latter approach, which was followed by the PCIJ in *Chorzów Factory*,[319] appears to indemnify the victim more comprehensively.[320] However, this approach is also more complex as it requires a hypothetical inquiry into what the situation would likely be if the wrongful act had not been committed.[321] For this reason, the ILC adopted the former, narrower concept.[322] In the view of the ILC, any remaining injury, such as loss of the use of goods wrongfully detained, shall be repaired by compensation.[323]

In the *Certain Activities* case, the ICJ partly refused claims for environmental damage because the affected area had already been revegetated at the time of the verdict.[324] At the same time, it awarded compensation for the impairment of environmental services until they had recovered.[325]

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314 *Ibid.*, Article 35.
315 *Ibid.*, Commentary to Article 35, para. 5.
316 See ICJ, Temple of Preah Vihear (Cambodia v. Thailand), Merits Judgment of 16 June 1962, ICJ Rep. 6.
317 Cf. *Lefeber* (n. 105), 133.
318 See 'Status quo ante', in: *Fellmeth/Horwitz* (n. 38), 267.
319 PCIJ, Factory at Chorzów (Germany v. Poland) (n. 254), 47; also see *Lefeber* (n. 105), 132–133.
320 Cf. *ibid.*, 132–133.
321 ARSIWA (n. 5), Commentary to Article 35, para. 2.
322 *Ibid.*
323 *Ibid.*; cf. *Crawford* (n. 4), 510–511.
324 ICJ, Certain Activities (Compensation) (n. 267), para. 74.
325 *Ibid.*, para. 78; see chapter 11, section B.III.

bb) Restitution Not Materially Impossible

Restitution is not required when it is 'materially impossible'.[326] According to the ILC, this encompasses situations where the property to be restored has been permanently lost or destroyed.[327]

In the context of environmental damage, restitution may be impossible when there is no way to restore the affected environmental components, such as in the case of an extinct species or the irreparable destruction of an ecosystem.[328] Moreover, the injury suffered between the commission of the wrongful act and the full recovery of the affected environment, namely the impairment or loss of the ability of the environment to provide goods and services in the meantime,[329] is usually not recoverable by restitution. Restitution may also be impossible when there have been other changes to the affected environment, such as changes in ownership or deforestation.[330]

Furthermore, restitution is impossible when the adverse environmental effects occur within the territory of the injured state. In such a situation, the responsible state will not be allowed to unilaterally take response measures without the permission of the injured state, as this would constitute a violation of the latter's territorial integrity.[331] Instead, the restoration measures will usually be implemented by the government of the injured state, which is normally in the best position to take immediate action to prevent and mitigate damage to its own land.[332] The responsible state will be required to reimburse the costs and expenses incurred by the injured state in taking such measures, which is usually included in the injured state's claim for compensation.[333]

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326 ARSIWA (n. 5), Article 35(a).
327 *Ibid.*, Commentary to Article 35, para. 8.
328 *Lefeber* (n. 105), 133; cf. *Crawford* (n. 4), 513.
329 Cf. ICJ, Certain Activities (Compensation) (n. 267), para. 42; also see ARSIWA (n. 5), Commentary to Article 35, para. 2.
330 Cf. Affaire des forêts du Rhodope central (fond) (Greece v. Bulgaria), Award of 19 March 1933, III RIAA 1405, 1432, see *Crawford* (n. 4), 513.
331 *Xue* (n. 26), 95; see Article 2(4) and (7) UN Charter (n. 178); *Shaw* (n. 24), 387–391; also see *Lefeber* (n. 105), 139.
332 *Xue* (n. 26), 95.
333 *Ibid.*; cf. ICJ, Certain Activities (Compensation) (n. 267), para. 41; but see *Lefeber* (n. 105), 139, who seems to assume that reimbursement of the costs of restoration measures is owed as a form of restitution. On the reimbursement of expenses incurred in taking response measures, see chapter 11, section A.

On the other hand, when the internationally wrongful act has caused damage to areas beyond the limits of national jurisdictions, it appears conceivable to require the responsible state to provide restitution in kind by implementing reasonable clean-up and restoration measures.[334] This approach caters best for the fact that damage to the environment in areas beyond the limits of national jurisdiction does not constitute an injury to individual states but rather to the international community as a whole.[335]

cc) Disproportionality of Restitution

Finally, restitution is ruled out when it involves a 'burden out of all proportion to the benefit deriving from restitution instead of compensation'.[336] In the view of the ILC, this only applies when there is a

> *'grave disproportionality between the burden which restitution would impose on the responsible State and the benefit which would be gained, either by the injured State or by any victim of the breach'.*[337]

The disproportionality of restitution is often raised in cases that concern the breach of procedural obligations. For example, in the *Pulp Mills* case, the ICJ refused to order the demolition of a pulp mill on the border river between Uruguay and Argentina because by building the mill, Uruguay had violated only procedural and not substantial obligations.[338] Hence, where the same substantive result could – and probably would – have occurred had the relevant procedures been followed, it may well be that restitution is disproportionate.[339] In other words, restitution 'should not give the injured State more than it would have been entitled to if the relevant obligation had been performed'.[340]

334 *Lefeber* (n. 105), 139.
335 But see *Xue* (n. 26), 255–257, who argues that clean-up and restoration actions in the common areas can prove difficult and complicated, and that any measurement of loss should therefore extend also to monetary compensation. However, *Xue* does not indicate who should be the recipient of such payments.
336 ARSIWA (n. 5), Article 35(b).
337 *Ibid.*, Commentary to Article 35, para. 11.
338 ICJ, Pulp Mills (n. 283), para. 275.
339 *Crawford* (n. 4), 514–515.
340 ARSIWA (n. 5), Commentary to Article 35, para. 3.

b) Compensation

In many cases, particularly those involving damage to the environment, it will be impossible to fully repair the damage resulting from an internationally wrongful act.[341] Article 36(1) ARSIWA provides that the responsible state is obliged to *compensate* for the damage caused by the wrongful act insofar as such damage is not made good by *restitution*.[342] The notion of 'compensation' refers to the payment of a sum that corresponds to the value that restitution in kind would bear.[343]

Like restitution, the award of compensation requires proof of actual harm as well as a causal link between the internationally wrongful act and the harm.[344] When these requirements are met, compensation shall cover any 'financially assessable damage including loss of profits insofar as it is established'.[345] In the view of the ILC, the obligation to serve compensation encompasses damage suffered both by the state itself and its nationals on whose behalf the state claims compensation by way of exercising diplomatic protection.[346]

The heads of compensable damage, as well as the principles of how such damage is quantified, largely depend on the content of the primary obligation breached.[347] The categories of damage frequently invoked include loss of life and personal injury (aa)), property damage (bb)), economic loss (cc)), and damage to the environment (dd)). Other issues include punitive damages (ee)) and the payment of interest (ff)).

341 *Lefeber* (n. 105), 133.

342 Cf. ICJ, Gabčíkovo-Nagymaros (n. 138), para. 152; ICJ, Construction of a Wall (n. 91), paras. 152–153; ICJ, Ahmadou Sadio Diallo (Republic of Guinea v. Democratic Republic of the Congo) (n. 255), para. 161.

343 PCIJ, Factory at Chorzów (Germany v. Poland) (n. 254), 47.

344 *Lefeber* (n. 105), 133.

345 ARSIWA (n. 5), Article 36(2).

346 *Ibid.*, Commentary to Article 36, para. 5. Diplomatic protection refers to the process by which a State invokes the responsibility of another State injury caused by an international wrongful act of the latter State to nationals of the former State, see *infra* section C.II.

347 ARSIWA (n. 5), Commentary to Article 36, para. 7; *Crawford* (n. 4), 519; *Stephan Wittich*, Compensation, in: Wolfrum/Peters (ed.), MPEPIL, MN. 12–13.

aa) Loss of Life and Personal Injury

It is generally recognized that a state may seek compensation for the death or personal injury suffered by its officials or nationals as a consequence of an internationally wrongful act.[348] Such compensation encompasses material losses such as medical expenses and the loss of earnings as well as non-material damage suffered by the affected individuals.[349] For instance, in the case concerning damages for the death of United States nationals in the sinking of the British ocean liner *Lusitania* by a German torpedo in 1915, the arbitrator held that compensation should encompass the losses of the surviving heirs, including financial sustenance, 'the pecuniary value […] of the deceased's personal services in claimant's care, education, or supervision' as well as reasonable compensation for mental suffering or shock caused by the death of their relatives.[350] Similarly, in the *Corfu Channel* case, the ICJ awarded compensation for the cost of pensions and other grants made by the United Kingdom to victims of the incident or their dependants, besides the costs incurred for medical treatment, administration and the like.[351] The *United Nations Claims Commission* awarded compensation for health damage not only to individuals for their injury or suffering[352] but also to states for their expenses incurred in combating public health problems caused by environmental damage that resulted directly from Iraq's invasion and occupation of Kuwait.[353]

Compensation for personal injury may also cover non-material damage, such as mental suffering or humiliation.[354] In the *Lusitania* case, the arbitrator held that 'such damages are very real, and the mere fact that they are

348 ARSIWA (n. 5), Commentary to Article 36, para. 16; *Xue* (n. 26), 87; *Wittich* (n. 347), MN. 27–29.

349 ARSIWA (n. 5), Commentary to Article 36, para. 16.

350 Opinion in the Lusitania Cases, 01 November 1923, VII RIAA 32, 35.

351 ICJ, Corfu Channel Case (United Kingdom v. Albania), Judgment on Compensation of 15 December 1949, ICJ Rep. 244, 249–250.

352 Cf. UNCC, Governing Council Decision 3. Personal Injury and Mental Pain and Anguish (23 October 1991), UN Doc. S/AC.26/1991/3; see *John J. Chung*, The United Nations Compensation Commission and the Balancing of Rights Between Individual Claimants and the Government of Iraq, 10 (2005) UCLA Journal of International Law & Foreign Affairs 141.

353 UNCC Panel Report F4/5 (2005) (n. 272), para. 68; see *Peter H. Sand/James K. Hammitt*, Public Health Claims, in: Cymie R. Payne/Peter H. Sand (eds.), Gulf War Reparations and the UN Compensation Commission (2011) 193; *Gautier* (n. 300), 204–205.

354 ARSIWA (n. 5), Commentary to Article 36, para. 16.

difficult to measure or estimate by money standards makes them none the less real and affords no reason why the injured person should not be compensated'.[355] Compensation for non-material damage was also awarded by the ICJ in the *Diallo* case, in which it relied on 'equitable considerations' to quantify the compensation due for the unlawful arrest, detention and expulsion of a Guinean national from the Democratic Republic of the Congo.[356]

bb) Property Damage

The second category of compensable damage is property damage or material injury. The scope of this category is broad and not necessarily confined to physical damage.[357] When claiming property damage, the claimant must establish a direct causal link between the damage and the loss of or reduction in the value of his property.[358] Compensation for the capital value of property damaged or destroyed due to an internationally wrongful act is generally determined based on the *fair market value* of the property,[359] which is defined as

> *'[t]he price that a seller is willing to accept and a buyer is willing to pay on the open market and in an arm's-length transaction'.*[360]

Determining compensation by referring to the market value of property encounters problems when the injured property is not regularly traded or when the property's actual value is not of a commercial nature but rather intangible or sentimental.[361] In these situations, it may be necessary to resort to estimates made by independent experts to assign a monetary value to the injured property.[362] Similar difficulties arise concerning envi-

355 Opinion in the Lusitania Cases (n. 350), 40.
356 ICJ, Diallo (Compensation) (n. 267), para. 24.
357 *Xue* (n. 26), 92.
358 *Lefeber* (n. 105), 133; *Xue* (n. 26), 89.
359 ARSIWA (n. 5), Commentary to Article 36, para. 22.
360 'Fair market value', in: Black's Law Dictionary (n. 19), 1865; cf. IUSCT, Starrett Housing Corporation v. Government of the Islamic Public of Iran et al., 14 August 1987, Award No. 314–24–1, 16 Iran–US CTR 112, para. 227.
361 Cf. ARSIWA (n. 5), Commentary to Article 36, para. 22.
362 Cf. UNCC, Report and Recommendations Made by the Panel of Commissioners Concerning Part Two of the First Instalment of Individual Claims for Damages Above US$100,000 (Category "D" Claims), UN Doc. S/AC.26/1998/3 (1998), paras. 44–50.

ronmental goods. For instance, the commercial value of standing timber can be assessed by referring to the average price of standing timber of the relevant species, reduced by the costs that would be incurred by harvesting the timber and transporting it to the market. However, this assessment presupposes that the injured party was willing to commercially utilize the timber rather than conserving it for ecological purposes.[363] Moreover, it should be taken into account that sustainable forestry would probably not allow harvesting all of the affected timber at once, but rather require limiting harvesting to a rate not exceeding the re-growth.[364]

In the *Certain Activities* case, the difficulties related to attributing monetary values to individual categories of impaired environmental goods, including timber, led the ICJ to adopt an 'overall assessment' approach, which in essence resulted in the award of a lump sum to the injured state.[365] Notably, in most past cases of large-scale damage by hazardous activities, the question of compensation was settled by negotiations rather than by adjudication; an important reason for this might be the difficulties involved in precisely determining the monetary value of the damage in question.[366]

cc) Loss of Profits or Income

Article 36(2) ARSIWA recognizes that compensable damage may include 'loss of profits insofar as it is established'. Loss of profits can be caused by injury to persons or property (or their unlawful taking),[367] but also by harm to the environment, in particular when businesses rely on certain environmental goods or services, such as beaches, forests or certain species.[368] However, loss of profits is only compensable when it is 'established', which means that the injured party must prove a causal relationship between the internationally wrongful act and the eventual loss of

363 On the valuation of environmental damage, see chapter 11, section B.II.2.
364 Cf. ICJ, Certain Activities (Compensation) (n. 267), paras. 60–61.
365 *Ibid.*, para. 78; see chapter 11, section B.III.4.
366 Cf. *Julio Barboza*, The Environment, Risk and Liability in International Law (2011), 46–64; *Xue* (n. 26), 90–92.
367 Cf. PCIJ, Factory at Chorzów (Germany v. Poland) (n. 254), 50–53; ICJ, Diallo (Compensation) (n. 267), para. 40.
368 Cf. *Lefeber* (n. 105).

(potential) income.[369] In the words of the ILC, this requires that 'an anticipated income stream has attained sufficient attributes to be considered a legally protected interest of sufficient certainty'.[370] This can be indicated by the existence of contractual arrangements or a well-established history of dealings.[371] On the other hand, profits that are merely prospective or even speculative will usually not be compensable.[372]

As far as evident, there has been no international arbitral or judicial decision expressly dealing with compensation for lost profits resulting from unlawful environmental interference, which is arguably due to the difficulties in establishing the extent and causality of losses in line with the aforementioned requirements.[373] However, some settlements reached by negotiations seem to include compensation for lost income, including the cases of the 1976 *Seveso* disaster and the 1986 *Sandoz* disaster.[374] Loss of income or profit is also expressly recognized as compensable damage in some civil liability conventions.[375]

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369 *Xue* (n. 26), 90; see ARSIWA (n. 5), Commentary to Article 36, para. 32, where the ILC argued that claims for lost profits are 'subject to the usual range of limitations on the recovery of damages, such as causation, remoteness, evidentiary requirements and accounting principles, which seek to discount speculative elements from projected figures'.

370 *Ibid.*, Commentary to Article 36, para. 27. See *Marjorie M. Whiteman*, Damages in International Law, Vol. III (1943), 1837, who argued that 'in order to be allowable, prospective profits must not be too speculative, contingent, uncertain, and the like. There must be proof that they were reasonably anticipated; and that the profits anticipated were probable and not merely possible'. This view was adopted in ICSID, Asian Agricultural Products Ltd. v. Republic of Sri Lanka, Award of 27 June 1990, ICSID Case No. ARB/87/3, para. 104.

371 ARSIWA (n. 5), Commentary to Article 36, para. 27; *Whiteman* (n. 370), 1837.

372 *Whiteman* (n. 370), 1837; *Crawford* (n. 4), 523; cf. ICSID, Asian Agricultural Products Ltd. v. Republic of Sri Lanka (n. 370), para. 107.

373 *Xue* (n. 26), 90.

374 *Ibid.*, 91.

375 See Vienna Convention on Civil Liability for Nuclear Damage (25 May 1963; effective 12 September 1997), 1063 UNTS 358, as amended by the Protocol of 12 September 1997 (effective 4 October 2003), IAEA Doc. INFCIRC/566 (hereinafter '1997 Vienna Convention on Civil Liability for Nuclear Damage'), Article 1(k); Convention on Civil Liability for Damage Caused During Carriage of Dangerous Goods by Road, Rail and Inland Navigation Vessels (10 October 1989; not yet in force), UN Doc. ECE/TRANS/79, Article 1(10)(c); International Convention on Civil Liability for Bunker Oil Pollution Damage (23 March 2001; effective 21 November 2008), IMO Doc. LEG/CONF.12/19 (hereinafter 'Bunker Oil Convention'), Article 1(9); Kiev Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial

dd) Damage to the Environment

Besides the 'traditional' types of damage discussed in the preceding sections, an internationally wrongful act may also cause damage to the environment that does not (only) materialize in individual injury. This poses the question of whether – and to what extent – environmental damage caused by an internationally wrongful act is subject to compensation.

On the one hand, it appears to be generally recognized that the costs of implementing response and reinstatement measures are compensable under international law. In its commentary to the ARSIWA, the ILC expressly mentioned 'the costs incurred in responding to pollution damage' as an example of damage subject to compensation under Article 36 ARSIWA.[376] Similarly, in its claim against the former Soviet Union for damage resulting from the crash of the Soviet nuclear-powered satellite *Cosmos 954*, Canada included 'only those costs that are reasonable, proximately caused by the intrusion of the satellite […] and capable of being calculated with a reasonable degree of certainty'.[377] This approach is also reflected in the vast majority of international treaties on operator liability, which recognize that the costs of 'preventive measures' as well as of 'reasonable measures of reinstatement actually undertaken or to be undertaken' are part of the damage for which the responsible operator shall be liable.[378]

On the other hand, compensation for damage to the environment *per se* is more controversial. Damage to the environment *per se*, or 'pure' environmental damage, refers to such injury that cannot be restored through remediation measures. This includes both a temporary impairment of the environment until its recovery, such as a reduction in the abundance of

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Accidents on Transboundary Waters (21 May 2003; not yet in force), UN Doc. ECE/MP.WAT/11-ECE/CP.TEIA/9, Article II(2)(d)(iii).

376 ARSIWA (n. 5), Commentary to Article 36, para. 8.

377 Canada, Department of External Affairs, Claim Against the Union of Soviet Socialist Republics for Damage Caused by Soviet Cosmos 954 (23 January 1979), 18 ILM 889, para. 23.

378 Cf. International Convention on Civil Liability for Oil Pollution Damage (29 November 1969; effective 19 June 1975), 973 UNTS 3, as amended by the Protocol of 27 November 1992 (effective 30 May 1996), 1956 UNTS 255, Article I(6) and (7); also see, e.g., Bunker Oil Convention (n. 375), Article I(9); 1997 Vienna Convention on Civil Liability for Nuclear Damage (n. 375), Article I(1)(k) and (m-o); Annex VI to the Protocol on Environmental Protection to the Antarctic Treaty: Liability Arising from Environmental Emergencies (14 June 2005; not yet in force), ATCM Measure 1 (2005) (hereinafter 'Antarctic Liability Annex'), Article VI(1); Supplementary Protocol (n. 12), Article 5(5).

a species, and permanent losses that cannot be restored, such as the complete loss of a species. However, it is often difficult to attribute a financial value to such losses, especially when they do not impair natural resources that have a market value because they are used economically. Since Article 36(2) ARSIWA provides that compensation shall cover 'financially assessable damage', it is sometimes argued that damage to the environment *per se* was not compensable under international law.[379] The same stance is taken by most of the aforementioned liability treaties, which usually limit compensation to the reimbursement of preventive and reinstatement measures.[380] However, the ILC also noted that environmental damage 'will extend beyond that which can be readily quantified in terms of clean-up costs or property devaluation', but that such damage 'is, as a matter of principle no less real and compensable than damage to property, though it may be difficult to quantify'.[381] This was recently confirmed by the ICJ in its judgment on compensation in the *Certain Activities* case, where it held that 'compensation is due for damage caused to the environment, in and of itself, in addition to the expenses incurred by an injured State as a consequence of such damage'.[382]

Nevertheless, compensation for environmental damage remains a highly complex topic prone to many uncertainties and controversies, which relate not only to the conditions under which expenses for response measures are subject to compensation but also to the question of whether, and if so, how damage to the environment *per se* shall be compensated. These issues, including a detailed assessment of the ICJ's judgment on environmental compensation in the *Certain Activities* case, are addressed in chapter 11 below.

ee) Punitive Damages

In cases of intentional and serious violations of international law, the idea of *punitive* or *exemplary damages* is sometimes put forward. The concept of punitive damages derives from common law and denotes the payment of damages in addition to those covering actual loss when the defendant

379 See, e.g., the statement of by Iran before the UN Compensation Commission, UNCC Panel Report F4/5 (2005) (n. 272), para. 46.
380 See *supra* n. 378.
381 ARSIWA (n. 5), Article 36, para. 15.
382 ICJ, Certain Activities (Compensation) (n. 267), para. 41.

acted with recklessness, malice, deceit, or other reprehensible conduct.[383] They are intended to punish the wrongdoer and thereby deter similar misconduct in the future.[384] The inclusion of punitive damages was discussed in the ILC during the drafting of the ARSIWA but ultimately rejected.[385] The ILC's final commentary clearly states that compensation 'is not concerned to punish the responsible State, nor does compensation have an expressive or exemplary character'.[386] This appears to reflect a wide consensus in international law.[387]

Nevertheless, the idea of awarding punitive damages resurrects from time to time.[388] For instance, in the *Certain Activities* case before the ICJ, a minority of judges argued that punitive damages should be considered in extraordinary cases 'where it is proven that a State has caused serious harm to the environment',[389] or that the award of damages should at least have regard to the gravity of the responsible state's actions.[390] However, the majority maintained that compensation should not have a punitive or exemplary character.[391]

ff) Interest

Article 38 ARSIWA provides that reparation may include the payment of interest 'when necessary in order to achieve full reparation'. According to the ILC's commentary, interest is not a necessary component of compensation in every case but might nevertheless be required 'in some

383 *Nina H. B. Jorgensen*, A Reappraisal of Punitive Damages in International Law, 68 (1998) BYIL 247; *Stephan Wittich*, Punitive Damages, in: James Crawford/Alain Pellet/Simon Olleson (eds.), The Law of International Responsibility (2010) 667, 667.
384 *Wittich* (n. 383), 667.
385 See *Crawford* (n. 4), 524–525; *Wittich* (n. 383), 672–674.
386 ARSIWA (n. 5), Commentary to Article 36, para. 4.
387 *Jorgensen* (n. 383), 266; *Crawford* (n. 4), 526; *Wittich* (n. 347), 674.
388 Cf. *Jefferi H. Sendut*, The International Court of Justice and Compensation for Environmental Harm: A Missed Opportunity?, 1 (2018) De Lege Ferenda 17, 25–27.
389 Cf. ICJ, Certain Activities (Compensation) (n. 267), Separate Opinion of Judge Bhandary, para. 18; Separate Opinion of Judge Cançado Trindade, para. 19.
390 Cf. *ibid.*, Dissenting Opinion of Judge ad hoc Dugard, para. 41–43.
391 Cf. *ibid.*, Judgment, para. 31; Declaration of Judge Gevorgian, para. 9; see *Kévine Kindji/Michael G. Faure*, Assessing Reparation of Environmental Damage by the ICJ: A Lost Opportunity?, 57 (2019) QIL 5, 12.

cases' to achieve full reparation for the injury caused by an internationally wrongful act.[392] However, the commentary provides no guidance as to the circumstances in which interest shall be paid. There also appears to be no uniform practice in international case law with regard to the situations in which interest is owed, the rate of interest and the time period during which interest accrues.[393] Nevertheless, when compensation is awarded in the form of a lump sum, interest is usually not awarded separately.[394] This is also reflected in the ICJ's recent judgment on compensation in the *Certain Activities* case. While the Court awarded pre-judgment interest on costs and expenses, it held that the claimant was not entitled to interest on the compensation for environmental damage, which the Court had determined by applying an 'overall valuation'.[395] At the same time, post-judgment interest appears to be broadly recognized in international case law.[396]

c) Satisfaction

Article 37 ARSIWA provides that when the injury cannot be made good by restitution or compensation, the state responsible for an internationally wrongful act is under an obligation to give satisfaction. Satisfaction is the appropriate remedy for non-material or 'moral' damage, which, although not financially assessable, nevertheless constitutes an 'affront to the State'.[397] Hence, possible forms of satisfaction include 'an acknowledgement of the breach, an expression of regret, a formal apology or an-

392 ARSIWA (n. 5), Commentary to Article 38, para. 1; also see *Crawford* (n. 4), 531–533.

393 Cf. PCIJ, Case of the S.S. "Wimbledon" (United Kingdom et al. v. Germany), Merits Judgment of 17 August 1923, PCIJ Rep. Ser. A, No. 1, 32; IUSCT, Iran v. United States, Decision of 30 September 1987, Case A19, Decision No. DEC 65-A19-FT, 16 Iran–US CTR 285, 289–290; ICJ, Diallo (Compensation) (n. 267), para. 56; ICJ, Certain Activities (Compensation) (n. 267), paras. 152–154; see ARSIWA (n. 5), Commentary to Article 38, para. 10; *Elihu Lauterpacht/Penelope Nevill*, The Different Forms of Reparation: Interest, in: James Crawford/Alain Pellet/Simon Olleson (eds.), The Law of International Responsibility (2010) 613.

394 ARSIWA (n. 5), Commentary to Article 38, para. 11.

395 Cf. ICJ, Certain Activities (Compensation) (n. 267), paras. 152–153; see chapter 11, section B.III.4.

396 Cf. PCIJ, Wimbledon (n. 393), 32; ICJ, Diallo (Compensation) (n. 267), para. 56; ICJ, Certain Activities (Compensation) (n. 267), para. 154.

397 ARSIWA (n. 5), Commentary to Article 37, para. 3.

other appropriate modality'.[398] Satisfaction may also consist of a monetary payment,[399] especially when a moral injury is suffered by individuals.[400] However, in disputes not involving individuals, the ICJ has repeatedly held that a judicial declaration of wrongfulness already constitutes an appropriate form of satisfaction.[401]

4. Contribution to the Injury and Failure to Mitigate Damage

In some situations, the state that has acted in contravention of international law may not be exclusively responsible for the resulting damage. Instead, the injured state may have contributed to the damage either intentionally or negligently. This is reflected in Article 39 ARSIWA, which provides that any wilful or negligent contribution to the damage by the injured state shall be taken into account when determining the reparation owed. By 'wilful or negligent', the Article refers to a 'lack of due care on the part of the victim of the breach for his or her own property or rights'.[402] The same applies when not the injured state but a person or entity for whom reparation is sought has contributed to the injury.[403]

Even when the injured state has not contributed to the damage, it must take all available steps to mitigate the damage.[404] Although the obligation to mitigate is not a legal obligation that gives itself rise to responsibility, a failure by the injured party to mitigate damage may preclude recovery to that extent.[405] In the *Gabčíkovo-Nagymaros* case, the ICJ recognized that

> *'an injured State which has failed to take the necessary measures to limit the damage sustained would not be entitled to claim compensation for that damage which could have been avoided'.*[406]

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398 *Ibid.*, Article 37(2).
399 *Ibid.*, Commentary to Article 37, para. 5.
400 *Wittich* (n. 347), para. 31; see *supra* section B.II.1.
401 See, e.g., ICJ, Corfu Channel (Merits) (n. 70), 35; ICJ, Bosnian Genocide (n. 8), para. 464; ICJ, Pulp Mills (n. 283), para. 269; cf. *Crawford* (n. 4), 529–530.
402 ARSIWA (n. 5), Commentary to Article 39, para. 5.
403 Cf. *ibid.*, Commentary to Article 39, para. 6.
404 *Crawford* (n. 4), 494–495.
405 ARSIWA (n. 5), Commentary to Article 31, para. 11; see *Wittich* (n. 347), MN. 20–21.
406 ICJ, Gabčíkovo-Nagymaros (n. 138), para. 80.

This principle was also applied by the environmental panel of the UNCC, which repeatedly stressed that claimant states were obliged to mitigate and contain environmental damage to the extent possible and reasonable in the circumstances. It held that this duty was 'a necessary consequence of the common concern for the protection and conservation of the environment, and entails obligations towards the international community and future generations'.[407] Where claimant governments had failed to take the necessary measures to prevent aggravation of environmental damage, compensation was either denied or reduced to take account of the fact that some of the damage was caused by factors not attributable to the responsible state.[408]

The concept of contribution to injury and the duty to mitigate damage are closely related and can at times be difficult to distinguish.[409] Both concern situations in which an injured state suffers (greater) damage due to its own conduct or omission.[410] However, while the duty to mitigate damage arises only after the damage has occurred, contributory negligence occurs at the time of the breach or the original infliction of damage.[411] For instance, a party to the Cartagena Protocol that has knowingly allowed transboundary movements of LMOs into its territory without applying the *Advance Informed Agreement* procedure may be barred from claiming reparation for damage subsequently resulting from these LMOs. However, even when it has followed all applicable norms and taken due care to avoid damage, a state's claim for reparation may be reduced when it has not taken all available steps to contain an LMO after it has proven harmful.

407 UNCC Panel Report F4/3 (2003) (n. 306), paras. 42–43; UNCC, Report and Recommendations Made by the Panel of Commissioners Concerning Part Two of the Fourth Instalment of "F4" Claims, UN Doc. S/AC.26/2004/17 (2004), para. 38; UNCC Panel Report F4/5 (2005) (n. 272), paras. 40–41.

408 See *Peter H. Sand*, Compensation for Environmental Damage from the 1991 Gulf War, 35 (2005) Environmental Policy and Law 244, 246; *Sands* et al. (n. 108), 758 with further references.

409 *Wittich* (n. 347), para. 40.

410 *Crawford* (n. 4), 501; *Wittich* (n. 347), para. 40.

411 *Wittich* (n. 347), para. 40; *Crawford* (n. 4), 501.

III. Right to Take Countermeasures

Countermeasures are measures that would normally contravene international obligations but are taken in response to a breach of international law by another state in order to induce the latter to cease the wrongful act and to make reparation.[412] Countermeasures are independent of international compliance control and dispute settlement mechanisms[413] and have therefore been described as a 'unilateral self-help measure'.[414]

As mentioned before, the international wrongfulness of a countermeasure is precluded under certain conditions.[415] A countermeasure may only be applied as long as the breach persists and shall be taken in a way that allows the other state to resume compliance with the obligations in question.[416] Moreover, countermeasures may not be taken while the dispute is pending before a court or tribunal with the authority to make decisions binding on the parties.[417]

When countermeasures are taken, they must be commensurate with the injury suffered, taking into account the gravity of the breach and the rights in question.[418] They must be terminated as soon as the responsible state has complied with its obligations under the law of state responsibility, i.e. that it ceased to act inconsistently with its primary obligations, has given assurances of non-repetition (where required), and has made full reparation for the injury caused by the breach.[419]

In any event, a countermeasure can only preclude wrongfulness in the relations between the injured state and the state which has committed the internationally wrongful act.[420] In the *Gabčíkovo-Nagymaros* case, the ICJ stressed that the measure in question must be 'directed against' the responsible state.[421] Similarly, the ILC underlined that in situations where the obligation breached by a lawful countermeasure is also owed to a third state, the wrongfulness of the measure is not precluded vis-à-vis that third

412 ARSIWA (n. 5), Article 49(1) and commentary to Part Three, chapter II, para. 1.
413 See *Duvic-Paoli* (n. 160), 343–354.
414 *Crawford* (n. 4), 676.
415 Cf. ARSIWA (n. 5), Article 22; ICJ, Gabčíkovo-Nagymaros (n. 138), paras. 83–87 and *supra* section A.IV.3.
416 ARSIWA (n. 5), Article 49 (2) and (3).
417 *Ibid.*, Article 52(3)(b).
418 *Ibid.*, Article 51.
419 *Ibid.*, Article 53.
420 Cf. *ibid.*, Commentary to Article 22, para. 5.
421 ICJ, Gabčíkovo-Nagymaros (n. 138), para. 83.

state.[422] Consequently, countermeasures cannot justify breaches of obligations owed *erga omnes (partes)* which serve the protection of common interests.[423] This is true for a vast number of obligations in international environmental law, especially those relating to the protection of global commons. When such obligations are breached, an injured state could only suspend compliance with a different obligation owed bilaterally.[424]

A closely related question is whether international law allows for 'collective countermeasures' taken by non-injured states in response to breaches of obligations owed *erga omnes (partes)*. Article 49 ARSIWA specifically refers to 'injured states' as those entitled to take countermeasures, which seemingly excludes non-injured states defending collective interests from taking countermeasures.[425] The ILC found 'no clearly recognized entitlement of States referred to in article 48 to take countermeasures in the collective interest'.[426] For this reason, Article 54 ARSIWA merely provides that the ARSIWA 'do not prejudice' the right of states to take lawful countermeasures when defending *erga omnes (partes)* obligations.[427] However, it has been argued more recently that collective countermeasures have received 'increasingly strong support' in state practice since the adoption of the ARSIWA in 2001.[428] Besides, sanctions imposed by non-compliance

422 ARSIWA (n. 5), Commentary to Article 49, para. 4.

423 *Lefeber* (n. 105), 143; see *infra* section C.I.2.a).

424 *Ibid.*, 143–144.

425 *Alan E. Boyle/Catherine Redgwell*, Birnie, Boyle, and Redgwell's International Law and the Environment (4th ed. 2021), 245.

426 ARSIWA (n. 5), Commentary to Article 55, para. 6; see *Linos-Alexander Sicilianos*, The Classification of Obligations and the Multilateral Dimension of the Relations of International Responsibility, 13 (2002) EJIL 1127, 1141–1144.

427 Cf. *Crawford* (n. 4), 703–706.

428 Cf. *Martin Dawidowicz*, Third-Party Countermeasures: A Progressive Development of International Law?, 29 (2016) QIL 3. Also see *Jonathan I. Charney*, Third State Remedies for Environmental Damage to the World's Common Spaces, in: Francesco Francioni/Tullio Scovazzi (eds.), International Responsibility for Environmental Harm (1991) 149, 161; *Jacqueline Peel*, New State Responsibility Rules and Compliance with Multilateral Environmental Obligations: Some Case Studies of How the New Rules Might Apply in the International Environmental Context, 10 (2001) RECIEL 82, 87. Also see ICJ, Construction of a Wall (n. 91), para. 159, where the Court implied that states were obliged to take lawful measures to bring to an end the ongoing violation of the right to self-determination of the Palestine people it had found. In any event, in cases involving direct injury to one or several states lawful countermeasures taken by third states would depend on the consent of the injured state(s), cf. *James Crawford*, Third Report on State Responsibility, UN Doc. A/CN.4/507 and Add. 1–4 (2000), para. 400.

procedures under multilateral environmental agreements could be seen as collective countermeasures, although they only are 'countermeasures' *stricto sensu* when their implementation is otherwise inconsistent with the international obligation of the states engaging in it.[429]

C. Implementation of State Responsibility

The previous sections have dealt with the requirements and legal consequences of state responsibility for harm resulting from modern biotechnology. The present section addresses the practical issues involved in implementing such responsibility. First of all, the right to invoke responsibility is generally limited to states *injured* by the breach, which raises problems in the context of obligations serving community interests such as the environment (I.). Secondly, injured nationals need to be represented by the affected state through *diplomatic protection*, which raises the question of whether these nationals must first exhaust any local remedies available to them in the responsible state (II.). The final subsection briefly touches upon the invocation and judicial enforcement of state responsibility (III.).

I. Standing to Invoke State Responsibility

It is generally recognized that a state is only entitled to invoke the international responsibility of another state when it has a legal interest in the matter.[430] Traditionally, only states whose subjective rights had been *injured* could invoke responsibility.[431] As held by the ICJ in the *Reparations* case of 1949, 'only the party to whom an international obligation is due can bring a claim in respect of its breach.'[432] In many cases, identifying the party whose rights have been violated by a breach does not entail particular diffi-

429 ARSIWA (n. 5), Commentary to Chapter II, para. 4; *Peter H. Sand*, Enforcing CITES: The Rise and Fall of Trade Sanctions, 22 (2013) RECIEL 251; see *infra* section C.III.3.a)aa).

430 *Okowa* (n. 279), 209.

431 *K. Sachariew*, State Responsibility for Multilateral Treaty Violations: Identifying the 'Injured State' and Its Legal Status, 35 (1988) NLR 273, 274; *Crawford* (n. 4), 542.

432 ICJ, Reparation for Injuries Suffered in the Service of the United Nations, Advisory Opinion of 11 April 1949, ICJ Rep. 174, 181–182; reaffirmed in ICJ, Barcelona Traction (n. 100), 82.

culties; for instance, a state affected by significant transboundary harm will be entitled to invoke the international responsibility of the source state.[433] But the question of standing is more difficult with regard to obligations that are not owed to a particular state but serve the protection of collective interests such as global biodiversity, because breaches of these obligations do not necessarily cause injury to individual states.[434]

Previously, there was a prevalent view both in legal scholarship and within the ILC that breaches of obligations owed to the international community as a whole (or the commission of 'international crimes') would result in all other states qualifying as 'injured states' and thus being individually entitled to invoke the international responsibility of the responsible state.[435] This was later given up in favour of a more narrow concept of 'injured states', while at the same time it was recognized that also non-injured states could have standing to invoke the responsibility of another state in certain cases.[436] Consequently, the final ARSIWA strictly distinguish between injured states, which are always entitled to invoke responsibility (1.), and non-injured states, which may only invoke responsibility under certain conditions (2.).[437]

1. Invocation of Responsibility by Injured States

Article 42 ARSIWA addresses the invocation of responsibility by injured states.[438] According to Article 42(a) ARSIWA, a state is entitled to invoke the responsibility as an injured state if the obligation breached is owed individually to the state concerned.[439] This applies to obligations resulting

433 *Okowa* (n. 279), 210; *Boyle/Redgwell* (n. 425), 243.
434 *Xue* (n. 26), 237.
435 Cf. *Sachariew* (n. 431), p. 279, 282; *Lefeber* (n. 105), 113–120; *Crawford* (n. 4), 542–544. It was recognized that some states among those injured could be 'especially affected', e.g. because they suffered material damage from a breach of a communitarian obligation, see *Sachariew* (n. 431), 287–289.
436 For a critical view, see *Tams* (n. 166), 770–775.
437 Cf. ARSIWA (n. 5), Commentary to Article 42, para. 1; *Giorgio Gaja*, The Concept of an Injured State, in: James Crawford/Alain Pellet/Simon Olleson (eds.), The Law of International Responsibility (2010) 941, 941–942; *Crawford* (n. 4), 542.
438 As clarified by Article 46 ARSIWA, there may also be a plurality of injured states, as several states may be injured by one and the same internationally wrongful act.
439 ARSIWA (n. 5), Article 42(a).

from a bilateral treaty concluded between the states concerned as well as obligations arising from bilateral custom or a unilateral undertaking made by one state to another.[440]

However, an obligation owed to another state individually may also arise from a multilateral undertaking. Although a multilateral treaty (or regional custom) establishes an engagement among all contracting parties, its performance in certain cases creates bilateral relationships between two parties.[441] In these situations, the performance of an obligation derived from a multilateral undertaking is owed to a specific state, regardless of whether the obligation is also owed to other states either simultaneously or under different circumstances.[442]

For this reason, multilateral treaties have been characterized as creating 'bundles' of interwoven bilateral obligations.[443] For example, the requirement to obtain the *Advance Informed Agreement* of the receiving state prior to the transboundary movement of an LMOs under the Cartagena Protocol[444] stipulates an obligation that only applies in the bilateral relationship between an exporting and an importing party. Similarly, the obligation to prevent unintentional transboundary movements of LMOs[445] is owed to all states parties to the Cartagena Protocol, but only those states actually affected by an unintentional transboundary movement can claim to be injured by a breach of this obligation.[446] If a breach of the obligation can be established, the affected state would be entitled to the full range of legal consequences following from the international responsibility of the source state, including reparation and the right to take countermeasures.

Article 42(b) ARSIWA provides for two scenarios involving breaches of collective obligations, i.e. obligations whose performance is not owed to a state individually, but to a group of states (such as the parties to a multilateral treaty) or the international community as a whole.[447] This

440 *Ibid.*, Commentary to Article 42, paras. 6–7; *Sicilianos* (n. 426), 1133; *Crawford* (n. 4), 545.
441 ARSIWA (n. 5), Commentary to Article 42, para. 8; *Tams* (n. 166), 776; *Gaja* (n. 437), 943–944.
442 *Crawford* (n. 4), 546.
443 *Sachariew* (n. 431), 277–278; *Sicilianos* (n. 426), 1133; see ARSIWA (n. 5), Commentary to Article 42, para. 8, pointing out that in this regard, the scope of Article 42(a) ARSIWA is different from that of Article 60(1) VCLT, which only applies to bilateral treaties.
444 Cf. Article 7(1) Cartagena Protocol; see chapter 3, section A.II.1.
445 Cf. Article 16(3) Cartagena Protocol; see chapter 3, section A.II.2.a)cc).
446 *Förster* (n. 175), 178.
447 ARSIWA (n. 5), Commentary to Article 42, para. 11.

refers to obligations that serve collective purposes rather than individual interests of the participating states and thus cannot be characterized as creating 'bundles' of bilateral obligations. In these situations, a state is only considered to be *injured* by a breach of the obligation when additional requirements are met.

According to the first scenario, set out in Article 42(b)(i) ARSIWA, a state is injured if it is 'specially affected' by the breach of a collective obligation. An example given in the ILC's commentary is a case of pollution of the high seas in breach of Article 194 UNCLOS that particularly affects one or several coastal states. Although the obligation serves the collective interest of all UNCLOS parties in the preservation of the marine environment in general, a coastal state whose beaches are polluted as a consequence of the breach would be regarded as specially affected, and thus injured by the breach.[448] A similar example within the scope of the present study is the obligation to regulate and control LMOs laid down in Article 8(g) CBD. While the obligation serves the protection of biodiversity globally,[449] an uncontrolled release or spread of an LMO could cause particular harm to the biodiversity of one or several states parties. In this case, the latter would be considered injured by the breach as a specially affected state in the sense of Article 42(b)(i) ARSIWA.

The second scenario in which breaches of collective obligations are equated to breaches of bilateral obligations, set out in Article 42(b)(ii) ARSIWA, concerns breaches that are 'of such a character as radically to change the position of all other states to which the obligation is owed'. This refers to so-called *integral obligations* which are conditioned upon their scrupulous performance by all states involved and breaches of which put in jeopardy the entire collective undertaking.[450] Examples of this 'relatively rare'[451] type of obligation are disarmament and non-proliferation undertakings,[452] such as the obligation not to acquire biological weapons under the *Biological Weapons Convention*.[453] Another example would be the obligation to refrain from territorial claims over parts of Antarctica

448 *Ibid.*, Commentary to Article 42, para. 12; also see *Xue* (n. 26), 245; *Gaja* (n. 437), 946–947; *Boyle/Redgwell* (n. 425), 243.

449 See chapter 3, section B.III.

450 ARSIWA (n. 5), Commentary to Article 42, para. 13; *Sicilianos* (n. 426), 1134; *Crawford* (n. 4), 547.

451 *Gaja* (n. 437), 945.

452 ARSIWA (n. 5), Commentary to Article 42, para. 13; *Crawford* (n. 4), 547.

453 Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) And Toxin Weapons and on Their Destruc-

enshrined in the *Antarctic Treaty*.[454] A breach of either obligation would affect all parties to the respective instruments, which would entitle them to the full range of legal consequences, including cessation and non-repetition, restitution, and the right to take countermeasures against the responsible state.[455]

Some authors have argued that integral obligations could also be found in the sphere of international environmental law.[456] However, the performance of environmental obligations is usually not conditioned upon their simultaneous performance by all other states parties in the sense that non-compliance by one state would void the whole purpose of the obligation.[457] Thus, obligations of an integral nature are not common in international environmental law. A possible exception could be seen in the proposed global moratorium on environmental releases of engineered gene drives,[458] as states could argue that their acceptance of such a moratorium was premised on the understanding that all other states would also refrain from conducting such releases in order to prevent a 'global race' for gene drive technology.

2. Invocation of Responsibility by Non-Injured States

In many cases, breaches of obligations that serve purely collective interests will not cause injury to individual states in the sense of Article 42 ARSIWA. This is particularly true for obligations concerned with the protection of global environmental goods, such as the global biodiversity, or of areas of common concern, such as the high seas beyond national jurisdiction.

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tion (10 April 1972; effective 26 March 1975), 1015 UNTS 163, Article I(1); see chapter 3, section J.I.

454 Antarctic Treaty (01 December 1959; effective 23 June 1961), 402 UNTS 71, Article 4; cf. ARSIWA (n. 5), Commentary to Article 42, para. 14; *Gaja* (n. 437), 945; *Crawford* (n. 4), 547.

455 ARSIWA (n. 5), Commentary to Article 42, para. 14.

456 Cf. *Sachariew* (n. 431), 281; *Peel* (n. 428), 89–91; *Crawford* (n. 4), 547.

457 *Sicilianos* (n. 426), 1135. But see *Peel* (n. 428), 89–91, who argues that fishery conservation agreements could be seen as establishing integral obligations by setting catch quotas for particularly vulnerable or over-fished species, and that by exceeding its allocated quota one state affects the enjoyment of fishing rights by all other state parties. But this overlooks that the compliance by other states with their respective quotas will remain unaffected by a breach; it is rather the joint conservation effort to prevent overfishing that is jeopardized.

458 See chapter 5, section A.

Violations of these obligations will not necessarily cause injury to any particular state (at least when no state is specially affected by the breach).[459] However, it is recognized that in case of breaches of obligations that serve collective interests, states may invoke the responsibility for a breach even when they are not themselves injured in the sense of Article 42 ARSIWA.[460] In the *Barcelona Traction* case, the ICJ distinguished obligations owed *vis-à-vis* individual states and obligations owed towards the international community as a whole.[461] With regard to the latter, the Court held that 'all States can be held to have a legal interest in their protection; they are obligations *erga omnes*'.[462] Thus, in some situations, states are entitled to invoke the international responsibility of another state even if they have not been injured by the internationally wrongful act (a)). But there are certain limitations to the remedies a non-injured state may seek (b)).

a) Right of Non-Injured States to Invoke Responsibility

The right of non-injured states to invoke the responsibility of another state for breaches of collective obligations is set out in Article 48 ARSIWA, which distinguishes between two types of collective obligations.

Article 48(1)(a) ARSIWA refers to obligations owed to a group of states, which are established to protect a collective interest of that group. These obligations are commonly referred to as obligations *erga omnes partes* because their performance is owed to all other states of the relevant group, i.e. the parties to a multilateral treaty or those states bound by a non-universal rule of customary international law.[463] The right of non-injured states to invoke breaches of obligations *erga omnes partes* appears to be

459 *Peel* (n. 428), 86. But see *James Crawford*, Fourth Report on State Responsibility, UN Doc. A/CN.4/517 and Add.1 (2001), para. 40, who suggests that also rules which primarily establish bilateral obligations could, at the same time, also serve a collective interest. This is also indirectly acknowledged in Article 48(2)(b) ARSIWA, which provides that a non-injured state can claim from the responsible state to perform its obligation of reparation, inter alia, 'in the interest of the injured State'. See infra, section C.I.2.b).

460 ARSIWA (n. 5), Commentary to Article 48, para. 2.

461 ICJ, Barcelona Traction (n. 100), para. 33.

462 *Ibid.*

463 ARSIWA (n. 5), Commentary to Article 48, para. 6; *Giorgio Gaja*, States Having an Interest in Compliance with the Obligation Breached, in: James Crawford/Alain Pellet/Simon Olleson (eds.), The Law of International Responsibility (2010) 957, 959.

generally accepted[464] and was also recognized by the ICJ in the case of *Belgium v. Senegal*.[465]

Many of the obligations analysed in the preceding chapters can be characterized as obligations *erga omnes partes*, including the obligation to establish appropriate risk management measures for LMOs[466] and the obligations to share relevant information on LMOs through the Biosafety Clearing-House.[467] These obligations serve the collective interest of all parties to improve the safety in handling LMOs, including by exchanging information. The same applies to most of the obligations contained in the *Nagoya–Kuala Lumpur Supplementary Protocol*. As shown above, the Protocol serves the collective interest in providing appropriate response measures to biodiversity damage caused by LMOs. However, it does not stipulate clear obligations that would apply in the bilateral relationship between a state of origin of a harmful LMO and a state affected by damage caused by it.[468]

The second type of collective obligations, addressed in Article 48(1)(b) ARSIWA, is obligations owed to the international community *as a whole*. This refers to obligations *erga omnes*, in respect of which all states are entitled to invoke the responsibility of any other state for an alleged breach. Traditional examples of obligations *erga omnes* are basic human rights such as the protection from slavery and racial discrimination,[469] the prohibition of aggression and genocide,[470] and the right of peoples to self-determination.[471] Besides, it is widely recognized in legal scholarship that certain environmental obligations, including the obligation to protect the marine environment and the environment in areas beyond national jurisdiction,

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464 Cf. *Okowa* (n. 279), 210–212; *Duvic-Paoli* (n. 160), 341.

465 ICJ, Questions relating to the Obligation to Prosecute or Extradite (Belgium v. Senegal), Judgment of 20 July 2012, ICJ Rep. 422, paras. 68–69.

466 Cf. Article 16(1) Cartagena Protocol; see chapter 3, section A.II.2.a)aa).

467 Cf. Article 20 Cartagena Protocol; see chapter 3, section A.II.3.

468 See chapter 6.

469 Cf. ICJ, Barcelona Traction (n. 100), para. 34.

470 Cf. *ibid.;* ICJ, Reservations to the Convention on the Prevention and Punishment of the Crime of Genocide, Advisory Opinion of 28 May 1951, ICJ Rep. 15, 23; ICJ, Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosnia and Herzegovina v. Yugoslavia), Preliminary Objections, Judgment of 11 July 1996, ICJ Rep. 595, para. 31.

471 ICJ, Case Concerning East Timor (Portugal v. Australia), Judgment of 30 June 1995, ICJ Rep. 90, para. 29; ICJ, Construction of a Wall (n. 91), para. 156; ICJ, Legal Consequences of the Separation of the Chagos Archipelago from Mauritius in 1965, Advisory Opinion of 25 February 2019, ICJ Rep. 95, para. 180.

also apply *erga omnes*.[472] Arguably, this also applies to the conservation of the global biological diversity, which is recognized as a 'common concern of mankind' in the preamble to the CBD.[473]

While it was previously controversial whether states can invoke breaches of obligations *erga omnes* even when they are not injured themselves,[474] the existence of such a right to an *actio popularis* now appears to be no longer contested.[475] For instance, the *Seabed Disputes Chamber* of ITLOS held that each state party to the UNCLOS was entitled to invoke the responsibility of another state for environmental damage caused by deep sea-bed mining

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472 Cf. *Frederic L. Kirgis*, Standing to Challenge Human Endeavors that Could Change the Climate, 84 (1990) AJIL 525, 527–528; *Charney* (n. 428), 161–162; *Lefeber* (n. 105), 124–128; *Okowa* (n. 279), 212–213; *Maurizio Ragazzi*, The Concept of International Obligations Erga Omnes (2000), 154–163; *Peel* (n. 428), 94–95; *Silja Vöneky*, Die Fortgeltung des Umweltvölkerrechts in internationalen bewaffneten Konflikten (2001), 332–335; *Sicilianos* (n. 426), 1135; *Xue* (n. 26), 246; *Boyle/Redgwell* (n. 425), 244. Moreover, *Okowa* (n. 279), 216, suggests that in cases of transboundary harm causing injury to individual states, the interests of other states in the protection of the environment should be treated as subordinate where other states have a better interest to protect. Also see ICJ, Nuclear Tests (Australia v. France), Judgment of 20 December 1974, ICJ Rep. 253, para. 50, where the Court considered France's announcement not to conduct any further atmospheric tests as a unilateral undertaking *erga omnes*. The issue of standing was not addressed in ICJ, Whaling in the Antarctic (Australia v. Japan: New Zealand intervening), Merits Judgment of 31 January 2014, ICJ Rep. 226, because Japan had not challenged Australia's standing to invoke a violation of the International Convention for the Regulation of Whaling of 1946.

473 Cf. CBD, Preambular para. 3; see *Malgosia A. Fitzmaurice*, Liability for Environmental Damage Caused to the Global Commons, 5 (1996) RECIEL 305, 308–310; *Lefeber* (n. 105), 126–127; *Förster* (n. 175), 184–187; *Schmitt* (n. 277), 419–422.

474 Cf. ICJ, South West Africa (Ethopia v. South Africa; Liberia v. South Africa), Judgment of 18 July 1966, ICJ Rep. 6, para. 88; ICJ, Nuclear Tests (Australia v. France) (n. 472), Dissenting Opinion of Judge Petren, p. 303; Dissenting Opinion of Judge de Castro, p. 387; Joint Dissenting Opinion of Judges Onyeama, Dillard, Jiménez de Aréchaga and Sir Humphrey Waldock, para. 117; see *Okowa* (n. 279), 212–215; *Peel* (n. 428), 95; *Edith Brown Weiss*, Invoking State Responsibility in the Twenty-First Century, 96 (2002) AJIL 798, 803–805; *Crawford* (n. 4), 552.

475 ALI, Restatement of the Law Third: Foreign Relations of the United States, Volume 2 (1987), § 902(1) and Comment a; *Charney* (n. 428), 175–176; *Fitzmaurice* (n. 473), 306–307; IDI, Resolution on Responsibility and Liability for Environmental Damage (n. 161), Article 27; *Peel* (n. 428), 95; ITLOS, Responsibilities and Obligations of States (n. 141), para. 180; *Duvic-Paoli* (n. 160), 342; *Boyle/Redgwell* (n. 425), 244; but see *Xue* (n. 26), 246–250.

due to the *erga omnes* character of the obligations relating to the preservation of the environment of the high seas and in the international seabed area.[476]

b) Remedies Available to Non-Injured States

A corollary question to the right of non-injured states to invoke breaches of obligations *erga omnes (partes)* is which remedies these states can seek. As the breached obligation is owed toward these states, it is beyond doubt that they can demand the responsible state to cease the wrongful act and, where required, to give appropriate assurances and guarantees of non-repetition.[477] This is also recognized in Article 48(2)(a) ARSIWA. However, a more complex issue is whether – and to what extent – non-injured states can also claim reparation.

As shown above, non-injured states that invoke the responsibility for breaches do so in the exercise of a collective interest in compliance with the obligation, but they will usually not have sustained damage affecting them individually. Hence, there is no reason to allow those states to claim reparation in their own name.[478] However, if reparation for damage to collective interests could not be claimed by any state, such damage would likely remain unrepaired. Even more, the unavailability of reparation for damage not affecting individual states could endanger the effectiveness of obligations *erga omnes (partes)*, as the remedies available to non-injured states would be limited to diplomatic protest, resort to non-compliance procedures and dispute settlement mechanisms (where available) and, arguably, the implementation of countermeasures.[479]

Article 48(2)(b) ARSIWA provides that a non-injured state can claim 'performance of the obligation of reparation in the interest of the injured state or of the beneficiaries of the obligation breached'. The ILC acknowledged that this provision involved 'a measure of progressive development', which in the view of the ILC was justified since it provided a means of protecting the community or collective interests at stake.[480] However, the

476 ITLOS, Responsibilities and Obligations of States (n. 141), para. 180.
477 Cf. *Duvic-Paoli* (n. 160), 343; *Gaja* (n. 463), 960–961.
478 *Johan G. Lammers*, International Responsibility and Liability for Damage Caused by Environmental Interferences, 31 (2001) Environmental Policy and Law 42–50 and 94–105, 46; *Gaja* (n. 463), 961.
479 *Gaja* (n. 463), 959; see *supra* section B.III.
480 ARSIWA (n. 5), Commentary to Article 48, para. 12.

question remains as to who should be the beneficiary of such reparation and what form such reparation should take. This is particularly difficult in the context of damage to 'global commons' such as global biodiversity and the environment in areas beyond the limits of national jurisdiction. Still, there are no apparent reasons why non-injured states could not claim the performance of reparation from the responsible state under Article 48(2)(b) ARSIWA. In particular, the requirement that reparation must be performed 'in the interest […] of the beneficiaries of the obligation breached' should not be construed too restrictively. This does not exclude the possibility that obligations aimed at protecting global commons may have no ultimate beneficiaries apart from the environment as such and the international community as a whole.[481] In these cases, non-injured states should not be barred from seeking reparation in pursuance of the collective interest, although account should be taken of the risk of parallel claims by multiple claimants.[482] Collective action, including through competent international organizations, would therefore be preferable but appears not to be legally required.

As to the available remedies, restitution *ad integrum* remains the primary means of reparation. In cases where damage can be repaired by clean-up or reinstatement measures, the responsible state can be required to implement such measures even if the injury does not affect individual states but common interests. Moreover, where non-injured states take such measures instead of the responsible state, they should be entitled to reimbursement of any reasonable expenses thereby incurred, in line with the established principles on such reimbursements.[483] Arguably, this includes compensatory restoration measures that seek to offset the damage by improving the environment in locations or forms other than those harmed.[484]

In situations in which restoration of the *status quo ante* is impossible, state responsibility provides for monetary compensation.[485] However, unlike restoration measures, monetary compensation requires a beneficiary to whom the payment shall be made. This could be resolved by resorting to funding mechanisms established within international organizations,

481 *Duvic-Paoli* (n. 160), 342–343.

482 *Charney* (n. 428), 158; *Lefeber* (n. 105), 120–121; *Boyle/Redgwell* (n. 425), 244–245.

483 *Gaja* (n. 463), 961; *Boyle/Redgwell* (n. 425), 244–245; see chapter 11, section A.

484 See chapter 11, section B.II.1. Also see *Duvic-Paoli* (n. 160), 343, mentioning the example of carbon offset projects to mitigate the climate impact of a coal power project.

485 See *supra* section B.II.3.b), and chapter 11, section B.II.

which could administer the sum to the benefit of the collective interest impaired.[486] For instance, the *Antarctic Liability Annex* provides for a dedicated fund into which payments shall be made in the event that no prompt and effective response action was taken in the event of an environmental emergency.[487] The fund, which is administered by the *Antarctic Treaty Secretariat*, shall be used to reimburse costs for response action taken in other cases.[488] Similar mechanisms could also be established in other fora such as the CBD system, where dedicated funds serving particular purposes have previously been established by a decision of the Conference of Parties.[489] An alternative approach could be to harness existing financial mechanisms, such as the *Global Environmental Facility*, which is the mechanism through which developing countries receive financial assistance in implementing the CBD under Article 21 CBD.[490]

II. Claims for Injured Nationals

1. The Law of Diplomatic Protection in Cases of Transboundary Harm

In many cases of transboundary environmental damage, damage may be suffered not only by the affected states but also by their nationals, especially in the form of personal injury, property damage or economic loss. However, since individuals are not subjects of public international law, they are usually – safe for special provisions such as investor-state dispute settlement clauses – not entitled to make claims against other states under the law of state responsibility.[491] Instead, injury to persons and damage

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486 *Peel* (n. 428), 93.

487 Cf. Antarctic Liability Annex (n. 378), Article 12.

488 Cf. *ibid.*

489 See, e.g., CBD COP, Decision VII/16. Participatory Mechanisms for Indigenous and Local Communities, UN Doc. UNEP/CBD/COP/DEC/VII/16, p. 28 (2004), para. 10, which established a voluntary trust fund to facilitate the participation of indigenous and local communities in the work of the CBD.

490 Cf. *Peel* (n. 428), 93, suggesting the same for breaches of the Montreal Protocol on Substances that Deplete the Ozone Layer (16 September 1987; effective 01 January 1998), 1522 UNTS 3, which in Article 10 provides for a financial mechanism similar to that of the CBD. Also see *Xue* (n. 26), 259–266.

491 See *Lassa F. L. Oppenheim*, International Law: A Treatise (2nd ed. 1912), § 289. But note that according to Article 33 ARSIWA, the rules in these articles on reparation are without prejudice to any right which may accrue directly to any non-state actor as a result of state responsibility. This is the case under some

to property resulting from internationally wrongful acts causing environmental harm is seen as being part of the injury caused to the affected state.[492] Consequently, the state has the right (but no obligation[493]) to claim reparation for the damage to its territory, including damages caused to its nationals or other persons under its jurisdiction.[494]

The invocation of another state's international responsibility for injury caused to nationals is called *diplomatic protection*. The ILC has elaborated a set of *Draft Articles on Diplomatic Protection*,[495] which set out the rules governing the circumstances and conditions under which diplomatic protection may be exercised. The Draft Articles are widely regarded as a codification of the pertinent rules of customary international law,[496] although they 'involve a degree of progressive development'.[497]

Traditionally and typically, the law of diplomatic protection was concerned with international obligations relating to the treatment of aliens abroad, i.e. nationals of the claimant state while they were present in the

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human rights treaties and in bilateral investment protection agreements, see ARSIWA (n. 5), Commentary to Article 33, para. 4.

492 Cf. PCIJ, Mavrommatis Palestine Concessions (Greece v. United Kingdom), Judgment of 30 August 1924, PCIJ Rep. Ser. B, No. 3, 12, emphasizing that '[b]y taking up the case of one of its subjects and by resorting to diplomatic action or international judicial proceedings on his behalf, a State is in reality asserting its own rights'. Also see ICJ, Nottebohm Case (Liechtenstein v. Guatemala), Second Phase, Judgment of 06 April 1955, ICJ Rep. 4, 24.

493 Cf. ICJ, Barcelona Traction (n. 100), paras. 78–79.

494 *Gautier* (n. 300), 205; see PCIJ, Mavrommatis Palestine Concessions (n. 492), 12.

495 ILC, Draft Articles on Diplomatic Protection with Commentaries (2006), YBILC 2006, Vol. II(2), p. 26.

496 Cf. *John Dugard*, Diplomatic Protection, in: Wolfrum/Peters (ed.), MPEPIL, MN. 6; ICJ, Ahmadou Sadio Diallo (Republic of Guinea v. Democratic Republic of the Congo), Preliminary Objections, Judgment of 02 May 2007, ICJ Rep. 582, para. 39; *Anna M. H. Vermeer-Künzli*, The Protection of Individuals by Means of Diplomatic Protection (2007), 9. But see *Bordin* (n. 8), who argues that the 'non-legislative codifications' prepared by the ILC (i.e. those which did not culminate in binding international treaties) lend their authority as codifications of customary international law on a number of institutional and textual factors, such as the membership of the ILC, the procedure of how these codifications are adopted within the ILC and the fact that the codification projects result in coherent and systematic presentation of the relevant rules which are easy to apply to actual cases.

497 *Crawford* (n. 4), 568. The ILC has indicated that it exercised progressive development with regard to Article 5 (cf. commentary, para. 2), Article 8 (cf. commentary, para. 2), Article 15(d) (cf. commentary, para. 11), and Article 19(b) and (c) (cf. commentary, paras. 3 and 4).

responsible state.[498] But the scope of the ILC's Articles on Diplomatic Protection is broader and covers all cases where a state is held responsible for injury allegedly caused to nationals of the claimant state by an internationally wrongful act.[499] Consequently, there is also a case of diplomatic protection when a state invokes the responsibility of another state for an injury suffered by its nationals as a result of transboundary harm originating from the responsible state.[500]

2. The Requirement to Exhaust Local Remedies in Cases of Transboundary Harm

The right of a state to exercise diplomatic protection depends on two essential conditions.[501] The first of these conditions is the *nationality requirement*, which stipulates that a state may only exercise diplomatic protection for natural and legal persons who are nationals of that state.[502] This entails several issues that involve no particular problems in cases of transboundary harm, such as the requirement of a 'genuine link' between the individual and the state[503] and the role of shareholders of companies.[504]

The second condition for the exercise of diplomatic protection is the *exhaustion of local remedies*, which requires that a state may only bring an international claim on behalf of a national when the latter has exhausted all available legal remedies in the state alleged to be responsible for the injury.[505] The rationale behind this requirement is that the responsible

498 ILC, Draft Articles on Diplomatic Protection (n. 495), Commentary to Article 1, para. 4. On the history of diplomatic protection, see *Vermeer-Künzli* (n. 496), 3–17.

499 Cf. ILC, Draft Articles on Diplomatic Protection (n. 495), Commentary to Article 1, para. 4. Other areas where diplomatic protection is exercised for individuals not necessarily present in the jurisdiction of the defendant state are the field of investment protection, see *Crawford* (n. 4), 587–592.

500 Cf. *Lefeber* (n. 105), 122; ILC, Draft Articles on Diplomatic Protection (n. 495), Commentary to Article 15, para. 7–8.

501 Also see Article 44 ARSIWA, which mirrors these conditions as requirements for the admissibility of claims invoking state responsibility.

502 Cf. ILC, Draft Articles on Diplomatic Protection (n. 495), Part Two.

503 See ICJ, Nottebohm Case (Liechtenstein v. Guatemala) (n. 492), 23.

504 For an overview, see *Dugard* (n. 496), MN. 19–52; *Crawford* (n. 4), 573–580.

505 ILC, Draft Articles on Diplomatic Protection (n. 495), Article 14; cf. ICJ, Interhandel (Switzerland v. United States), Preliminary Objections, Judgment of 21 March 1959, ICJ Rep. 6, 27; ICJ, Elettronica Sicula S.p.A. (ELSI) (United States

state shall be given the opportunity to redress its violation by its own means before a case is escalated at the intergovernmental level.[506]

It appears possible that individuals affected by transboundary harm may be able to obtain compensation under the national legal system of the source state. As shown above, there is arguably an emerging rule of customary international law that states shall provide prompt, adequate and effective compensation to foreign victims of transboundary harm in their domestic legal systems.[507] Moreover, it has been argued that existing civil law regimes already provide sufficiently effective remedies for cross-border damage caused by LMOs.[508] At the same time, states are reluctant to accept harmonized standards on civil liability in cases of transboundary harm.[509] This is aptly demonstrated by the *Nagoya–Kuala Lumpur Supplementary Protocol*, which focuses on administrative liability[510] and only vaguely stipulates an obligation of states to provide for civil liability for LMO damage in their domestic legal systems.[511] Nevertheless, it cannot be generally assumed that there are no effective local remedies in the state of origin in situations of transboundary harm caused by LMOs. For an international claim based on state responsibility to be admissible, such remedies would first need to be exhausted, which would require that the claim was brought before the competent tribunals and pursued as far as permitted by the local laws and procedures.[512]

However, it is questionable whether the local remedies rule applies in the context of transboundary harm. Article 15(c) of the Articles on Diplo-

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of America v. Italy), Judgment of 20 July 1989, ICJ Rep. 15, para. 50. See generally *Borchard* (n. 29), 239–247; *Chittharanjan F. Amerasinghe*, Local Remedies in International Law (2nd ed. 2004).

506 ICJ, Interhandel (n. 505), 27.

507 See chapter 8, section F.

508 Cf. *Lucas Bergkamp*, Liability and Redress: Existing Legal Solutions for Traditional Damage, in: CropLife International (ed.), Compilation of Expert Papers Concerning Liability and Redress and Living Modified Organisms (2004) 21; *Thomas Kadner Graziano/Matthias Erhardt*, Cross-Broder Damage Caused by Genetically Modified Organisms: Jurisdiction and Applicable Law, in: Bernhard A. Koch (ed.), Damage Caused by Genetically Modified Organisms (2010) 784.

509 See generally *Anne Daniel*, Civil Liability Regimes as a Complement to Multilateral Environmental Agreements, 12 (2003) RECIEL 225; *Jutta Brunnée*, Of Sense and Sensibility: Reflections on International Liability Regimes as Tools for Environmental Protection, 53 (2004) ICLQ 351.

510 For a clarification of this term, see chapter 2, section G.

511 See chapter 6.

512 ICJ, Elettronica Sicula (n. 505), para. 59; see ILC, Draft Articles on Diplomatic Protection (n. 495), Commentary to Article 14, para. 6.

matic Protection provides that local remedies do not need to be exhausted in situations where there was 'no relevant connection' between the injured person and the state alleged to be responsible. In the view of the ILC, this includes cases of transboundary environmental harm, as it would be 'unreasonable and unfair' to require an injured person to exhaust local remedies even though there was no voluntary link or territorial connection between that person and the state from which the harm emanated.[513] Consequently, a state could make an interstate claim on behalf of its nationals affected by transboundary harm under the law of state responsibility without having to first exhaust any local remedies that might be available.

Nevertheless, it has been called into question whether the requirement to exhaust local remedies should be excluded in all cases of transboundary harm.[514] While governmental action at the interstate level may well be the only way to achieve effective reparation in cases of widespread damage, it has been argued that in more typical cases of transboundary nuisance, there was no obvious reason to exclude the requirement to exhaust local remedies where such remedies were available and feasible to pursue for the injured individuals.[515] Moreover, it has been submitted that state practice indicates that states usually prefer non-discriminatory, transnational access to civil liability under domestic jurisdictions over state liability processed through inter-state claims.[516]

However, this does not justify the assumption that the local remedies rule generally applies to cases of transboundary harm. The decisive difference to conventional cases of diplomatic protection is that in cases of transboundary harm, the victims have not voluntarily subordinated themselves to the jurisdiction of the source state.[517] Instead, damage is caused to individuals residing in the jurisdiction of the injured state, and the causation of damage may well be the only tangible link between the source state and the injured individuals.[518] Therefore, it seems unjustifiable to

513 *Ibid.*, Commentary to Article 15, para. 7.

514 *Alan E. Boyle*, Globalising Environmental Liability: The Interplay of National and International Law, 17 (2005) J. Envt'l L. 3, 24; *Boyle/Redgwell* (n. 425), 234.

515 Cf. *Okowa* (n. 279), 219–220, who refers to cases where injury is suffered by a multiplicity of cases scattered in different states, as in the case of long-range air pollution or an incident of the Chernobyl type.

516 *Boyle/Redgwell* (n. 425), 234.

517 *Günther Handl*, The Environment: International Rights and Responsibilities, 74 (1980) ASIL Proceedings 223, 232; *Lammers* (n. 289), 622; *Lefeber* (n. 105), 123; *Okowa* (n. 279), 218–219.

518 *Lefeber* (n. 105), 123.

assume a general requirement to exhaust local remedies in the source state – even where they are available – before a state affected by transboundary harm can make claims on behalf of its nationals.[519]

This conclusion is also supported by the ILC's commentary on the *Principles on Allocation of Loss*, which underlines that these principles were 'without prejudice to the rules relating to state responsibility and any claim that may lie under those rules in the event of a breach of the obligations of prevention'.[520] Hence, the ILC envisaged the law of state responsibility and civil liability as complementary rather than mutually exclusive regimes.[521]

In any event, the local remedies rule does not apply where a state asserts claims not on behalf of its nationals but in its own name.[522] Article 14(3) of the Articles on Diplomatic Protection provides that the exhaustion of local remedies is only required where a claim is brought 'preponderantly on the basis of an injury to a national'. In cases of transboundary harm, the principal injury is that to the territorial integrity of the affected state, whereas damage suffered by individuals is only consequential to that injury. Consequently, claims for reparation are not – at least not preponderantly – based on injury to nationals, and thus the local remedies requirement is inapplicable in these cases.[523]

519 Cf. *Dionyssios M. Poulantzas*, The Rule of Exhaustion of Local Remedies and Liability for Space Vehicle Accidents, 31 (1965) Journal of Air Law and Commerce 261; *C. Wilfried Jenks*, Liability for Ultra-Hazardous Activities in International Law, 117 (1966) RdC 99, 121; *Lefeber* (n. 105), 123; *Amerasinghe* (n. 505), fn. 5 at p. 248.

520 ILC, Draft Principles on the Allocation of Loss in the Case of Transboundary Harm Arising Out of Hazardous Activities, with Commentaries (2006), YBILC 2006, vol. II(2), p. 56, General Commentary, para. 7; see chapter 8, section E.

521 Cf. *Boyle/Redgwell* (n. 425), 234.

522 ILC, Draft Articles on Diplomatic Protection (n. 495), Commentary to Article 14, para. 9; see *Amerasinghe* (n. 505), 146–168.

523 Cf. *Kenneth B. Hoffman*, State Responsibility in International Law and Transboundary Pollution Injuries, 25 (1976) ICLQ 509, 537–541; *Lammers* (n. 289), 622; *Lefeber* (n. 105), 123–124; *Alexandre Kiss*, Present Limits to the Enforcement of State Responsibility for Environmental Damage, in: Francesco Francioni/Tullio Scovazzi (eds.), International Responsibility for Environmental Harm (1991) 3, 7; *Gautier* (n. 300), 205.

III. Invocation and Enforcement of State Responsibility

While state responsibility arises automatically as a legal consequence of the commission of an internationally wrongful act, the injured state or other interested states commonly need to raise claims for cessation or reparation. Thus, once the standing of a state to invoke another state's international responsibility has been established, the question arises of how such a claim is to be made and how disputes over the existence of a breach of international law or the obligation to make reparation can be resolved.[524] The ILC's Articles on State Responsibility only provide some fundamental guidance on this issue (1.). In the event of controversies about a breach or its legal consequences, states resort to dispute settlement, which involves negotiations, arbitration and adjudication (2.). An alternative means to promoting compliance with multilateral environmental agreements may be seen in dedicated compliance procedures established by these agreements (3.).

1. The Claims Process Envisaged in the ARSIWA

In the version adopted by the ILC in its first reading, the ARSIWA included an elaborate system for resolving disputes regarding their application or interpretation.[525] However, when it became clear that the articles would not evolve into a binding multilateral treaty, these articles were discarded.[526] Consequently, the final ARSIWA only contain some fragmented rules on the process of invoking state responsibility, which only covers certain procedural aspects.

Article 43(1) ARSIWA provides that an injured state that invokes another state's responsibility shall give notice of its claim to that state. According to Article 43(2), the injured state may specify the conduct it expects the responsible state to take to cease the wrongful act and what form of reparation shall be made. In principle, the injured state is entitled to choose between the available forms of reparation; in particular, it may opt for compensation instead of restitution. However, there may be situations in which the injured state may not 'pocket compensation and walk away

524 See *Borchard* (n. 29), 247–250.

525 Cf. ILC, Draft Articles on State Responsibility with Commentaries Thereto Adopted by the ILC on First Reading (1997), UN Doc. A/CN.4/L.528/Add.3, 352–373.

526 *Crawford* (n. 4), 553.

from an unresolved situation',[527] especially in cases involving environmental damage. As shown below, international case law favours the implementation of clean-up and restoration measures over the mere payment of compensation for environmental damage.[528] This is particularly true where a state claims reparation as a non-injured state, acting on behalf of a collective interest.[529] The ILC also noted that such situations could not be resolved by a settlement, just as an injured state may not release the responsible state from continuing obligations owed to a larger group of states or the international community as a whole.[530]

Pursuant to Article 45 ARSIWA, the responsibility of a state may not be invoked if the injured state has validly waived the claim or acquiesced in its lapse. This refers to conduct by the injured state in response to the internationally wrongful act, as opposed to consent, which precludes the wrongfulness of the breach from the outset.[531] Besides, it is often disputed whether a lapse of time can result in a loss of the right to invoke responsibility. In the *Phosphate Lands* case, the ICJ acknowledged that international law does not specify any specific time limits and that it was for the Court to determine in the light of the circumstances of each case whether the passage of time has rendered an application inadmissible.[532]

2. Settlement of Disputes

In many cases, the invocation of another state's responsibility for a breach of international law will entail disagreements over the relevant facts and the pertinent rules of international law. A 'dispute' arises when a state addresses specific claims to another state, which the latter rejects.[533] Nu-

527 ARSIWA (n. 5), Commentary to Article 43, para. 6.
528 See chapter 11.
529 See *supra* section C.I.2.
530 ARSIWA (n. 5), Commentary to Article 43, para. 6.
531 *Crawford* (n. 4), 558.
532 ICJ, Certain Phosphate Lands in Nauru (Nauru v. Australia), Preliminary Objections, Judgment of 26 June 1992, ICJ Rep. 240, 253–254.
533 *Christian Tomuschat*, Article 2(3) UNC, in: Bruno Simma/Daniel-Erasmus Khan et al. (eds.), The Charter of the United Nations (3rd ed. 2012) 181–199, 27. See PCIJ, Mavrommatis Palestine Concessions (n. 492), 11, which noted that '[a] dispute is a disagreement on a point of law or fact, a conflict of legal views or of interests between two persons'. Also see ICJ, Right of Passage over Indian Territory (Portugal v. India), Preliminary Objections, Judgment of 26 November 1957, ICJ Rep. 125, 148–149; ICJ, Case Concerning East Timor (Por-

merous provisions of international law provide that states shall resolve their disputes peacefully, i.e. without resorting to armed force.[534] The most prominent instance is Article 2(3) of the *UN Charter*, which stipulates that all UN Members 'shall settle their international disputes by peaceful means in such a manner that international peace and security, and justice, are not endangered'.[535] Article 33(1) of the Charter provides a list of such peaceful means, namely 'negotiation, enquiry, mediation, conciliation, arbitration, judicial settlement, resort to regional agencies or arrangements, or other peaceful means of their choice'. However, this is merely indicative[536] because 'general international law takes an eclectic approach to the methods and fora used to settle international disputes'.[537]

In practice, most environmental disputes that are resolved are settled amicably through negotiations between the states concerned.[538] This is particularly true for cases of transboundary harm.[539] It has been observed that 'states often negotiate compensation or some other performance due for an internationally wrongful act'.[540] Such settlements usually do not address (or admit) state responsibility but are usually made *ex gratia* and expressly without prejudice to any question of responsibility.[541] The amount of compensation is usually not calculated in detail but determined by a lump-sum agreement that stipulates a global sum payable to the injured state and is understood to cover all claims.[542]

Cases which cannot be solved through diplomatic channels are ripe for settlement through arbitration or adjudication, albeit there is no obligation to participate in any such proceedings under general international

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tugal v. Australia) (n. 471), 99–100. On the term 'international environmental disputes', see *Richard B. Bilder*, The Settlement of Disputes in the Field of the International Law of the Environment, 144 (1975) RdC 140, 153–156.

534 See *Bilder* (n. 533), 156–159; *Tomuschat* (n. 533), 37.

535 UN Charter (n. 178), Article 2(3); also see UNGA, Declaration on Principles of International Law Concerning Friendly Relations and Co-Operation Among States in Accordance with the Charter of the United Nations (24 October 1970), UN Doc. A/RES/2625 (XXV) (hereinafter 'Friendly Relations Declaration').

536 See *ibid.*, which provides that 'parties shall agree upon such peaceful means as may be appropriate to the circumstances and nature of the dispute'.

537 *Boyle/Redgwell* (n. 425), 264; also see *Bilder* (n. 533), 159–161.

538 *Bilder* (n. 533), 224–226.

539 See the cases discussed by *Barboza* (n. 366), 50–60.

540 *Michael Waibel*, The Diplomatic Channel, in: James Crawford/Alain Pellet/Simon Olleson (eds.), The Law of International Responsibility (2010) 1085, 1095.

541 *Ibid.*; see chapter 11.

542 *Ibid.; Barboza* (n. 366), 62–64.

law. Moreover, although the *International Court of Justice* (ICJ) is the 'principal judicial organ' of the United Nations,[543] it enjoys no priority as a forum for dispute settlement.[544] The jurisdiction of the Court comprises all cases which the parties refer to it by special agreement, matters specifically provided for in the UN Charter and in international agreements,[545] and cases between those (currently 73[546]) states which have accepted the jurisdiction of the Court as compulsory.[547] While the ICJ has dealt with a number of cases involving environmental matters,[548] it is not the only available forum for the settlement of environmental disputes. Many of these disputes were submitted to *ad hoc* arbitration,[549] including under the auspices of the *Permanent Court of Arbitration*, which has elaborated dedicated rules for arbitration of disputes concerning natural resources or the environment.[550] Besides, the *International Tribunal of the Law of the Sea* (ITLOS) has addressed several cases concerning the marine environment,[551] although the obligatory dispute settlement mechanism under the

543 UN Charter (n. 178), Article 92.

544 *Boyle/Redgwell* (n. 425), 264.

545 ICJ Statute (n. 157), Article 36(1).

546 Cf. ICJ, Declarations Recognizing the Jurisdiction of the Court as Compulsory, available at: http://www.icj-cij.org/en/declarations (last accessed 28 May 2022).

547 ICJ Statute (n. 157), Article 36(2)-(5).

548 Some of the most prominent cases being ICJ, Nuclear Tests (Australia v. France) (n. 472); ICJ, Pulp Mills (n. 283); ICJ, Gabčíkovo-Nagymaros (n. 138); ICJ, Whaling in the Antarctic (Australia v. Japan: New Zealand intervening) (n. 472); ICJ, Certain Activities/Construction of a Road (Merits) (n. 160); ICJ, Certain Activities (Compensation) (n. 267).

549 See Trail Smelter Case, Decision of 1941 (n. 248); Affaire du Lac Lanoux (Spain v. France), 16 November 1957, XII RIAA 281; PCA, MOX Plant Case (Ireland v. United Kingdom), Award of 06 June 2008, Case No. 2002–01; PCA, Iron Rhine Arbitration (Belgium v. Netherlands), Award of 24 May 2005, Case No. 2003–02, XXVII RIAA 35.

550 PCA, Optional Rules for Arbitration of Disputes Relating to Natural Resources and/or the Environment (2001); see *Dane P. Ratliff*, The PCA Optional Rules for Arbitration of Disputes Relating to Natural Resources and/or the Environment, 14 (2001) Leiden J. Int'l L. 887.

551 See, e.g., ITLOS, The MOX Plant Case (Ireland v. United Kingdom), Order of 03 December 2001, Case No. 10, ITLOS Rep. 89; ITLOS, Case concerning Land Reclamation by Singapore in and around the Straits of Johor (Malaysia v. Singapore), Provisional Measures, Order of 08 October 2003, Case No. 12, ITLOS Rep. 10; ITLOS, Responsibilities and Obligations of States (n. 141); ITLOS, Southern Bluefin Tuna Cases (New Zealand v. Japan; Australia v. Japan), Provisional Measures, Order of 27 August 1999, ITLO cases Nos. 3 and 4, ITLOS Rep. 288.

UN Convention on the Law of the Sea is not adjudication by ITLOS, but arbitration.[552]

Many multilateral environmental agreements contain provisions for the settlement of disputes over their interpretation or application.[553] For instance, Article 27 of the CBD provides that parties shall first seek to resolve such disputes by negotiations; they may also 'seek the good offices of, or request mediation by, a third party'. If the dispute cannot be resolved by these means, the parties may submit the case either to arbitration under dedicated rules laid down in Annex II to the CBD or to the ICJ, which can both render a legally binding decision to resolve the dispute.[554] If neither of the procedures has been accepted by all parties to the dispute,[555] the dispute shall be submitted to 'conciliation' under rules also laid down in Annex II to the CBD.[556] The conciliation commission shall render a proposal for the resolution of the dispute, which is not legally binding[557] but which the parties must consider in good faith.[558] The CBD's provisions on dispute settlement also apply to the CBD protocols.[559] However, they have so far never been used.

In any event, arbitral and judicial proceedings seem not to be well equipped to deal with global environmental problems, particularly due

552 UNCLOS (n. 140), Article 287(5); see *Tullio Treves*, Article 287 UNCLOS, in: Alexander Proelss (ed.), United Nations Convention on the Law of the Sea: A Commentary (2017), MN. 20.

553 See, e.g., Convention on International Trade in Endangered Species of Wild Fauna and Flora (03 March 1973; effective 01 July 1975), 993 UNTS 244, Article XVIII; Vienna Convention for the Protection of the Ozone Layer (22 March 1985; effective 22 September 1988), 2513 UNTS 293, Article 11; United Nations Framework Convention on Climate Change (09 May 1992; effective 21 March 1994), 1771 UNTS 107, Article 14; Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (22 March 1989; effective 05 May 1992), 1673 UNTS 57, Article 20; International Plant Protection Convention (New Revised Text) (17 November 1997; effective 02 October 2005), 2367 UNTS 223, Article XIII.

554 Convention on Biological Diversity (05 June 1992; effective 29 December 1993), 1760 UNTS 79 (hereinafter 'CBD'), Article 27(3); see *Lyle Glowka* et al., A Guide to the Convention on Biological Diversity (1994), 118.

555 So far, only four parties (namely Austria, Cuba, Georgia, and Latvia) have accepted one or both of the procedures, see CBD Secretariat, Handbook of the Convention on Biological Diversity (3rd ed. 2005), 385–395.

556 CBD (n. 554), Article 27(4).

557 See *Glowka* et al., IUCN Guide to the CBD (n. 554), 119.

558 CBD (n. 554), Annex II, Part 2, Article 5.

559 *Ibid.*, Article 27(5).

to the requirement to have *standing* to invoke breaches of international obligations.[560] While parties to multilateral treaties may intervene in proceedings concerning the interpretation of those treaties before the ICJ and ITLOS,[561] intervention in respect of customary obligations requires the third party to be 'affected' by the decision in the case and is also subject to judicial discretion.[562] Consequently, in his separate opinion in the *Gabčíkovo-Nagymaros* case, judge *Weeramantry* expressed the view that the Court's traditional *inter partes* procedures might be inadequate for dealing with allegations of breaches involving important obligations *erga omnes*, such as 'momentous environmental issues' with consequences spreading beyond the immediate litigants.[563]

3. Non-Compliance Procedures

Another instrument to address the non-compliance of states with their international obligations is dedicated *compliance mechanisms* (or *non-compliance procedures*), which have become a ubiquitous feature of multilateral environmental agreements.[564] Compliance mechanisms seek to address cases of non-compliance by inducing and aiding states to resume the performance of their obligations under the respective instrument. They usually operate in a non-adversarial, consultative manner and are thus situated between diplomatic negotiations and judicial forms of dispute settlement.[565] Moreover, they are usually 'strictly forward-looking' in the

560 See *supra* section C.I.

561 ICJ Statute (n. 157), Article 63; ITLOS Statute, Annex VI of UNCLOS (n. 140), Article 32.

562 ICJ Statute (n. 157), Article 62; ITLOS Statute, Annex VI of UNCLOS (n. 140), Article 31; see *Boyle/Redgwell* (n. 425), 263.

563 ICJ, Gabčíkovo-Nagymaros (n. 138), Separate opinion Judge Weeramantry, p. 117–118.

564 Cf. See generally *Malgosia A. Fitzmaurice/C. Redgwell*, Environmental Non-Compliance Procedures and International Law, 31 (2000) Netherlands Yearbook of International Law 35; *Jutta Brunnée*, Enforcement Mechanisms in International Law and International Environmental Law, in: Ulrich Beyerlin/Peter-Tobias Stoll/Rüdiger Wolfrum (eds.), Ensuring Compliance with Multilateral Environmental Agreements (2006) 1, 12–22; *Jan Klabbers*, Compliance Procedures, in: Daniel Bodansky/Jutta Brunnée/Ellen Hey (eds.), The Oxford Handbook of International Environmental Law (2007); *Duvic-Paoli* (n. 160), 343–354; *Boyle/Redgwell* (n. 425), 254–260.

565 Cf. *Sands* et al. (n. 108), 172.

sense that their sole objective is to achieve future compliance rather than sanctioning past violations.[566] Compliance mechanisms rest on the recognition that many cases of non-compliance are not caused by intent or bad faith but rather by the inability of the party concerned to fulfil its obligations.[567] Consequently, the main feature of many compliance mechanisms is the provision of technical or financial support.[568]

a) The Compliance Mechanism Under the Cartagena Protocol

aa) Role, Functions and Procedures

The most relevant compliance mechanism in the present context is that of the Cartagena Protocol.[569] In line with Article 34 of the Protocol, the first meeting of the parties to the Protocol (COP-MOP) established *Procedures and Mechanisms on Compliance*.[570] The mechanism's objective is to promote compliance with the Protocol, address cases of non-compliance, and provide advice or assistance on matters relating to compliance.[571] The mechanism shall operate in a non-adversarial and cooperative manner and be guided by the principles of transparency, fairness and predictability.[572] The mechanism's functions are performed by a *Compliance Committee*

566 *Duvic-Paoli* (n. 160), 347.
567 *Brunnée* (n. 564), 19; *Klabbers* (n. 564), 103.
568 *Brunnée* (n. 564), 18; see *Duvic-Paoli* (n. 160), 345–346.
569 Cartagena Protocol on Biosafety to the Convention on Biological Diversity (29 January 2000; effective 11 September 2003), 2226 UNTS 208.
570 CP COP-MOP, Procedures and Mechanisms on Compliance Under the Cartagena Protocol on Biosafety, Annex to Decision BS-I/7, UN Doc. UNEP/CBD/BS/COP-MOP/1/15, p. 65, Annex (2004); see *Veit Koester*, The Compliance Mechanism of the Cartagena Protocol on Biosafety: Development, Adoption, Content, and First Years of Life, in: Marie-Claire Cordonier Segger/Frederic Perron-Welch/Christine Frison (eds.), Legal Aspects of Implementing the Cartagena Protocol on Biosafety (2013) 164; *Chiara Ragni*, Procedures and Mechanisms on Compliance Under the 2000 Cartagena Protocol on Biosafety to the 1992 Convention on Biological Diversity, in: Tullio Treves/Laura Pineschi et al. (eds.), Non-Compliance Procedures and Mechanisms and the Effectiveness of International Environmental Agreements (2009) 101.
571 Procedures and Mechanisms on Compliance under the Cartagena Protocol (n. 570), section I, para. 1.
572 *Ibid.*, section I, para. 2–3.

consisting of 15 individuals elected by the COP-MOP and serving in a personal capacity.[573]

Besides addressing general issues of compliance and making recommendations, the Compliance Committee's main task is to review individual cases of non-compliance referred to it.[574] Submissions can be made by any party either with respect to its own compliance (*self-trigger*) or with respect to another party (*party-to-party trigger*), provided that it is 'affected or likely to be affected' by the other party's alleged non-compliance.[575] This limits the potential of the compliance mechanism because it does not allow parties to defend the common interest of all parties in ensuring the safe handling and use of LMOs in cases where either no party is individually affected or where the affected party elects not to make a submission.[576] Also, unlike similar mechanisms,[577] neither the CBD Secretariat nor the public (including NGOs[578]) is entitled to make submissions.

Once a submission has been made, the party concerned shall respond and provide the 'necessary information'.[579] Besides the information provided by the party concerned and the party that has made the submission, the Compliance Committee may also consider relevant information from other (subsidiary) bodies of the CBD and the Cartagena Protocol,[580] which

573 *Ibid.*, section II; see *Ragni* (n. 570), 106–107.

574 Cf. Procedures and Mechanisms on Compliance under the Cartagena Protocol (n. 570), section III.

575 *Ibid.*, section IV, para. 1.

576 The limitation that only states which are affected or likely to be affected by the non-compliance of another party may trigger the compliance mechanism is a restriction which is common to MEAs that address bilateral transboundary relations, see *Francesca Jacur Romanin*, Triggering Non-Compliance Procedures, in: Tullio Treves/Laura Pineschi et al. (eds.), Non-Compliance Procedures and Mechanisms and the Effectiveness of International Environmental Agreements (2009) 373, 375–376. Also see *Duvic-Paoli* (n. 160), 347–350, who argues that a merit of compliance mechanisms is that they allow for the enforcement of 'non-bilateralizable' *erga omnes* obligations. Yet, this shows once more that, although the stated objective of the Cartagena Protocol is to contribute to the conservation and sustainable use of biodiversity as a whole, the Protocol's actual focus is rather on ensuring each state's sovereignty with regard to the admission of LMOs into its territory.

577 See *Jacur Romanin* (n. 576), 377–381.

578 See *Astrid Epiney*, The Role of NGOs in the Process of Ensuring Compliance with MEAs, in: Ulrich Beyerlin/Peter-Tobias Stoll/Rüdiger Wolfrum (eds.), Ensuring Compliance with Multilateral Environmental Agreements (2006) 319.

579 Procedures and Mechanisms on Compliance under the Cartagena Protocol (n. 570), section IV, para. 3.

580 *Ibid.*, section V.

also (non-explicitly) includes the CBD Secretariat as a potential source of information.[581]

To address cases of non-compliance, the Committee may take a range of measures such as providing advice or assistance to the party concerned and making recommendations to the COP-MOP regarding the provision of financial and technical assistance.[582] The Committee may request the party concerned to develop a 'compliance action plan' setting out measures to return to compliance, although the timeframe for such a plan is to be agreed upon between the Committee and the party concerned.[583] The Committee may also 'invite' the party concerned to submit progress reports and report about its efforts to the COP-MOP.[584] Cases of non-compliance shall remain on the Committee's agenda until adequately resolved'.[585]

The COP-MOP may, upon the recommendations of the Compliance Committee, provide financial and technical assistance, issue a 'caution' to the concerned party, and request the CBD's Executive Secretary to publish cases of non-compliance in the Biosafety Clearing-House. The COP-MOP shall also be responsible for taking specific measures to address cases of repeated non-compliance.

In other compliance mechanisms, measures in response to persistent or repeated non-compliance include the suspension of treaty rights or even the imposition of trade restrictions,[586] which can be seen as an implementation of the right to treaty suspension under Article 60 VCLT.[587] However, developing a catalogue of such measures was deferred until

581 *Koester* (n. 570), 171.

582 Procedures and Mechanisms on Compliance under the Cartagena Protocol (n. 570), section VI, para. 1(a).

583 *Ibid.*, section V, para. 2(c).

584 *Ibid.*, section V, para. 1(e).

585 *Ibid.*

586 Cf. CP COP-MOP, Compliance (Article 34): Measures in Cases of Repeated Non-Compliance: Note by the Executive Secretary, UN Doc. UNEP/CBD/BS/COP-MOP/3/2/Add.1 (2006); *Ragni* (n. 570), 114–115; *Sand* (n. 429); also see *Brunnée* (n. 564), 19–20, noting that in providing for the suspension of privileges, these MEAs come close to deploying actual penalties for non-compliance, 'which has remained rare in general international law'.

587 VCLT (n. 243); cf. ARSIWA (n. 5), Commentary to Chapter II, para. 4 see *Malgosia A. Fitzmaurice*, Non-Compliance Procedures and the Law of Treaties, in: Tullio Treves/Laura Pineschi et al. (eds.), Non-Compliance Procedures and Mechanisms and the Effectiveness of International Environmental Agreements (2009) 453, 467–472; *Sand* (n. 429), 259.

'experience may justify the need for developing and adopting such measures'.[588] One observer assumed that this made it unlikely that the COP-MOP would ever adopt stringent measures, as such measures could not be developed *in abstracto* when motivated by a concrete case of repeated non-compliance.[589]

bb) Recent Practice

To date, the Compliance Committee has not yet received any submission concerning individual non-compliance.[590] One of the reasons for this may be that only states can make submissions, while the compliance mechanisms of other multilateral environmental agreements are mostly triggered by the respective treaty secretariats and NGOs rather than states.[591] Consequently, the Compliance Committee has so far only been able to review 'general issues of compliance'.[592]

Nevertheless, apparently based on a broad interpretation of its mandate, the Compliance Committee has recently begun to address the compliance of individual states without having received a submission, especially concerning the obligation to implement the Protocol at the national level and with regard to reporting obligations.[593] In this respect, the Compliance Committee expressly decided to consider certain cases as *individual cases of non-compliance*.[594] Besides, it requested certain parties to develop and

588 Procedures and Mechanisms on Compliance under the Cartagena Protocol (n. 570), section VI, para. 2(d); CP COP-MOP, Decision BS-IV/1. Report of the Compliance Committee, UN Doc. UNEP/CBD/BS/COP-MOP/4/18, p. 33 (2008), para. 3.

589 *Koester* (n. 570), 182.

590 On the work of the Compliance Committee in its first years, see *Ragni* (n. 570), 109–110; *Koester* (n. 570), 172–186. There appears to be no more recent assessment of the Committee's work.

591 *Ragni* (n. 570), 119.

592 Cf. Procedures and Mechanisms on Compliance under the Cartagena Protocol (n. 570), section III, para. 1(d).

593 CP Compliance Committee, Report of the Committee on the Work of Its Fourteenth Meeting, UN Doc. CBD/CP/CC/14/5 (2017), para. 25; CP Compliance Committee, Report of the Committee on the Work of Its Fifteenth Meeting, UN Doc. CBD/CP/CC/15/5 (2018), paras. 25–29; also see CP Compliance Committee, Review of General Issues of Compliance: Report of the Executive Secretary, UN Doc. CBD/CP/CC/15/4 (2018).

594 CP Compliance Committee, Report of 15th Meeting (2018) (n. 593), para. 30.

implement *compliance actions plans*[595] and, in some instances, even recommended that the COP-MOP issue a caution to these parties.[596] However, the decision ultimately adopted by the COP-MOP neither expressly named nor cautioned the parties concerned.[597]

cc) Legal Status

The measures adopted by the Compliance Committees are not legally binding upon the parties concerned.[598] Arguably, the obligatory nature of non-compliance procedures lies more in the duty of parties to participate than in their outcomes and results.[599] At the same time, compliance mechanisms produce an 'authoritative, institutional finding of non-compliance' that not only exerts 'social pressure' on the party concerned but, over time, also generates a 'pattern of "institutionalized" protest against non-compliance'.[600] Therefore, the effect of most decisions can be described as entailing a 'soft' or 'de facto' binding effect,[601] thus coming close to the 'soft law' status of COP decisions.[602]

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595 *Ibid.*, para. 32.

596 CP Compliance Committee, Report of the Committee on the Work of Its Thirteenth Meeting, UN Doc. UNEP/CBD/BS/CC/13/6 (2016), para. 12(g) and Annex I; CP Compliance Committee, Report of 15th Meeting (2018) (n. 593), para. 37 and Annex I.

597 Cf. CP COP-MOP, Decision VIII/1. Compliance, UN Doc. CBD/CP/MOP/DEC/VIII/1 (2016); CP COP-MOP, Decision 9/1. Compliance, UN Doc. CBD/CP/MOP/DEC/9/1 (2018); see CP Compliance Committee, Report of the Committee on the Work of Its Sixteenth Meeting, UN Doc. CBD/CP/CC/16/7 (2019), paras. 12–13, noting with regret that the COP-MOP had not taken up the Committee's recommendation to caution the party concerned, and acknowledging that 'naming Parties in non-compliance could be a useful tool for promoting compliance'.

598 Cf. *Robin R. Churchill/Geir Ulfstein*, Autonomous Institutional Arrangements in Multilateral Environmental Agreements: A Little-Noticed Phenomenon in International Law, 94 (2000) AJIL 623, 643–647; *Klabbers* (n. 564), 999; *Enrico Milano*, The Outcomes of the Procedure and Their Legal Effects, in: Tullio Treves/Laura Pineschi et al. (eds.), Non-Compliance Procedures and Mechanisms and the Effectiveness of International Environmental Agreements (2009) 407, 412.

599 *Milano* (n. 598), 417.

600 *Ibid.*, 414; also see *Duvic-Paoli* (n. 160), 352.

601 *Fitzmaurice* (n. 587), 463–467.

602 See chapter 5, section B.II.

b) The Relationship Between Non-Compliance Procedures and State Responsibility

As set out above, non-compliance procedures react to breaches of international law by inducing and aiding states to resume the performance of their obligations. Against this background, it is questionable how they relate to the other consequences of state responsibility, particularly the right of the injured state(s) to take countermeasures and the obligation to make full reparation for any injury caused by the breach. More specifically, one wonders whether non-compliance procedures constitute *lex specialis* regimes in the sense of Article 55 ARSIWA that precede over the general rules on state responsibility.[603]

However, these mechanisms are not intended to constitute 'self-contained regimes' that address all the consequences of non-compliance differently, separately and independently from the general rules on state responsibility.[604] As shown above, the sole objective of compliance mechanisms is to ensure future compliance with the obligation. In terms of state responsibility, compliance mechanisms focus on achieving cessation and non-repetition of the wrongful conduct, but not on repairing the injury that the non-compliance has caused in the past. However, this does not mean that the non-compliant state is relieved from its international responsibility for having acted inconsistently with its international obligations. Nor is a state 'immunized' from responsibility while implementing a compliance action plan agreed with the competent compliance committee.[605] Consequently, compliance mechanisms are not an alternative to the law of state responsibility but should rather be seen as an (albeit 'softer'[606]) means to implement the international responsibility of a state.[607]

The above conclusions also apply to the Cartagena Protocol's non-compliance mechanism. According to Article 13, the compliance procedures shall be 'separate from, and without prejudice to', the arbitration and

603 See *Laura Pineschi*, Non-Compliance Procedures and the Law of State Responsibility, in: Tullio Treves/Laura Pineschi et al. (eds.), Non-Compliance Procedures and Mechanisms and the Effectiveness of International Environmental Agreements (2009) 483, 483–486.

604 *Ibid.*, 490; *Fitzmaurice/Redgwell* (n. 564), 58; see generally *Eckart Klein*, Self-Contained Regime, in: Wolfrum/Peters (ed.), MPEPIL.

605 But see *Klabbers* (n. 564), 1006.

606 *Fitzmaurice/Redgwell* (n. 564), 39; *Boyle/Redgwell* (n. 425), 248.

607 *Pineschi* (n. 603), 497.

conciliation procedures under Article 27 of the CBD.[608] Moreover, the *Supplementary Protocol on Redress and Liability* to the Cartagena Protocol provides in Article 11 that it shall not affect the rights and obligations of states under the general rules of state responsibility.[609] Although this does not directly apply to the Cartagena Protocol, it can be seen as a clear expression of *opino iuris* by the parties to the latter that adopted the Supplementary Protocol by consensus.[610]

Before the Cartagena Protocol entered into force, a minority of parties proposed establishing a differentiated, more comprehensive regime on non-compliance. According to this approach, any failure by a developed country or LMO-exporting party to comply with the Cartagena Protocol would have triggered a judicial process and entailed sanctions, whereas non-compliance by a developing country or importing party should have only triggered a non-judicial cooperative procedure.[611] However, this approach was rejected in favour of the non-judicial, non-adversarial mechanism now in place.[612] Consequently, the Protocol's compliance mechanism does not constitute a 'self-contained regime' in the sense that it provides a legal framework for the consequences of non-compliance detached from the law of state responsibility.[613]

Two scenarios clearly demonstrate that compliance mechanisms are neither intended nor able to replace the law of state responsibility. The first case is where a state has suffered individual injury as a consequence of the non-compliance.[614] As shown above, non-compliance procedures generally focus on the resumption of the performance of the obligation but do not provide for reparation for the injury suffered as a consequence of the non-performance. Thus, when a state can establish that it has been injured by the breach within the meaning of Article 42 ARSIWA, it is entitled to reparation under the law of state responsibility.[615] This applies, in particu-

608 See *supra* section C.III.2.
609 See chapter 6, section E.III.
610 See chapter 6, section A.
611 ICCP, Report of the Intergovernmental Committee for the Cartagena Protocol on Biosafety on the Work of Its First Meeting, UN Doc. UNEP/CBD/ICCP/1/9 (2001), 33, para. 54; IISD, First Meeting of the Intergovernmental Committee for the Cartagena Protocol on Biosafety: 11–15 December 2000, ENB Vol. 9 No. 173 (2000), 8.
612 Procedures and Mechanisms on Compliance under the Cartagena Protocol (n. 570), Section IV; see *Ragni* (n. 570), 119.
613 *Ibid.*; also see *Fitzmaurice/Redgwell* (n. 564), 57–59.
614 *Pineschi* (n. 603), 494.
615 *Ibid.*; see *supra* section B.II.

lar, where multilateral treaties create bilateral obligations,[616] such as the obligations relating to the transboundary movements of LMOs under the Cartagena Protocol.[617] In principle, such claims would have to be made independently from the non-compliance procedure.[618] While it would be advisable for the injured state to resort first to any available non-compliance procedure and makes individual claims for reparation only after the procedure has formally determined a case of non-compliance,[619] this appears not to be legally required.

The second case where a 'fallback' to the law of state responsibility is required is where a non-compliance mechanism fails to fulfil its objective. This may be either due to a continuous violation despite a decision of the system's competent organ or due to a procedural failure, i.e. the inability of the system to deliver on its mandate, for instance because there is a deadlock in the relevant decision-making organ.[620] In these cases, the non-compliance mechanism does not achieve the purpose for which it has been established.[621] Where the aim of achieving a resumption of performance by following the non-confrontational approach fails, it is required to resort to the general rules of state responsibility, including the right to take countermeasures in line with the principles set out above.[622] In this respect, the suspension of treaty rights as a 'last resort' to address persistent non-compliance could also be seen as a form of institutionalized, collective countermeasures.[623]

4. Conclusions

States have multiple options to invoke another state's responsibility for a breach of international law. If a breach is controversial, international arbitration or adjudication is most commonly used. However, states are

616 *Pineschi* (n. 603), 496.
617 See chapter 3, section A.II.
618 See *Fitzmaurice/Redgwell* (n. 564), 56–57.
619 Cf. *Ragni* (n. 570), 116.
620 *Pineschi* (n. 603), 492.
621 This is regarded as a case of 'regime failure', see *Martti Koskenniemi*, Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law: Report of the Study Group of the International Law Commission, UN Doc. A/CN.4/L.682 (2006), paras. 188–190.
622 See *Pineschi* (n. 603), 493 and fn. 42; see *supra* section B.III.
623 Cf. *Fitzmaurice/Redgwell* (n. 564), 55–56.

not generally obliged to participate in such proceedings unless they have agreed so, either in a general way (e.g. by accepting the ipso facto jurisdiction of the ICJ) or by way of a special agreement.

If binding dispute settlement is unavailable, non-compliance and conciliation procedures under international treaties are an alternative to draw attention to a state's (alleged) violations. In the present context, the conciliation process under the CBD and the non-compliance mechanism under the Cartagena Protocol could be relevant fora to address, for instance, unilateral releases of self-spreading LMOs that are likely to or already have spread to the territory of other states or in areas beyond national jurisdiction. These mechanisms do not produce enforceable 'hard' decisions but only quasi-normative 'soft law'. Nevertheless, even a 'soft' yet formal finding of non-compliance arguably exerts considerable pressure on a state, making it more likely that it ceases the conduct in question and makes reparation.

D. Summary and Outlook

The present chapter has assessed the requirements and conditions under which a state can be held responsible for a breach of international law. In principle, the law of state responsibility provides far-reaching consequences, including unlimited responsibility for any injury caused by the breach. At the same time, however, state responsibility is also subject to several limitations and caveats.

First of all, states are not generally responsible for the conduct of individuals within their jurisdiction. The conduct of natural or legal persons is only attributed to the state under certain limited conditions; there is no 'vicarious responsibility' of states for the conduct of private actors within their jurisdiction.[624] In the context of transboundary environmental interference, the focus is therefore on the obligations of states to adequately regulate hazardous activities and, in the event of damage, to provide for the liability and redress.[625] However, hazardous conduct can become directly attributable when the state itself engages in such conduct or effectively controls such conduct carried out by non-state actors.[626]

624 *Bratspies* (n. 41), 211; see *supra* section A.II.
625 See *supra* section A.II.6.
626 See *supra* section A.II.2.

Secondly, the main challenge to implementing state responsibility remains to establish a breach of an international obligation. In general terms, this requires showing that the conduct in question was not in conformity with the relevant obligation.[627] However, proving the relevant facts, including what the responsible state *could* and *should* have done to prevent damage and that this failure caused the damage, will often involve difficult evidentiary questions. Similar difficulties may arise regarding the proof of causation, especially when the damage only manifests in the long term or when there is more than one possible pathway or multiple states that are jointly responsible for the damage. While a detailed treatment of the law of evidence before international courts and tribunals is beyond the present study's scope,[628] it has been shown that international courts and tribunals are reluctant to lower the standard of proof required to establish the existence of a causal link between the responsible state's failure to adequately regulate a hazardous activity or organism and the resulting of damage.[629]

When a breach can be established, the responsible state must cease the wrongful conduct and make reparation for any injury caused by it. In principle, the obligation to make full reparation applies not only to 'traditional' damage such as personal injury, property damage, and economic loss, but also to damage to the environment *per se*.[630] This will become particularly relevant when self-spreading LMOs cause damage to native species, ecosystems or biological diversity at large. The extent to which such damage is compensable under international law is assessed separately in chapter 11.

A third critical aspect is a state's international responsibility can only be invoked by other states. In the absence of dedicated treaties, foreign private actors cannot directly make claims against the state of origin but need to be represented by their respective states. It has been shown that the requirement to exhaust *local remedies* does not apply in cases of transboundary harm because unlike in conventional cases of *diplomatic protection*, the victims have not voluntarily subordinated themselves to the jurisdiction of the source state.[631] However, since states are not bound to

627 See *supra* section A.III.2.
628 See *Markus Benzing*, Das Beweisrecht vor internationalen Gerichten und Schiedsgerichten in zwischenstaatlichen Streitigkeiten (2010).
629 See *supra* section B.II.2.a).
630 See *supra* section B.II.3.b)dd).
631 See *supra* section C.II.2.

accept the jurisdiction of any international court or tribunal, there will, in many cases, be no adequate legal mechanism to enforce the liability of the state of origin.[632] This may well prove to be the biggest obstacle to enforcing state responsibility for transboundary damage caused by biotechnology. Compliance mechanisms established by multilateral environmental agreements such as the Cartagena Protocol may be better equipped to promote adherence to international rules.[633] Yet, they fulfil different functions. While compliance mechanisms are 'forward-looking' and aim to ensure the future compliance of states with their obligations;[634] state responsibility remains the relevant regime to rectify injury that has already been caused by breaches of international obligations.

Taking all this together, it could be argued that the practical relevance of international law on state responsibility for addressing damage caused by applications of modern biotechnology is rather limited.[635] In fact, states may well regard the ambiguities of the law of state responsibility as a 'convenient buffer' against claims based on responsibility.[636] Against this background, it comes as no surprise that there have only been a few cases in which states were successfully held responsible *ex post facto* for breaching their preventive obligations.[637] Many writers have been sceptical about the utility of state responsibility to address transboundary and global environmental challenges.[638] Indeed, the responsibility of another state has been invoked formally only in a few cases, and its relevance in addressing international cases of damage caused by modern biotechnology could therefore be questioned.

Nevertheless, it has also been observed that the utility of state responsibility 'lies not so much in the number of cases resolved within the framework of litigation, but in acting as a springboard from which all other regulatory and accountability frameworks derive their ultimate legit-

632 See *supra* section C.III.2.
633 See *supra* section C.III.3.a).
634 See *supra* section C.III.3.b).
635 *Saxler* et al. (n. 98), 118–123, argue similarly in the field of geoengineering.
636 *Jutta Brunnée*, COPing with Consent: Law-Making Under Multilateral Environmental Agreements, 15 (2002) Leiden J. Int'l L. 1.
637 See *Barboza* (n. 366), 46–52.
638 See, e.g., *Klabbers* (n. 564), 1001; *Fitzmaurice/Redgwell* (n. 564), 37; *Saxler* et al. (n. 98), 118–123; *Brunnée* (n. 509), 354–356; *Boyle/Redgwell* (n. 425), 246–247.

imacy'.[639] This is all the more true in the context of the present study. As shown earlier, it seems currently more likely that states will move forward with releasing modified organisms capable of self-propagation unilaterally than in internationally coordinated efforts.[640] Against this background, the law of state responsibility and the ensuing potential liability for damage remains important to ensure compliance with the relevant international treaties, predominantly the CBD, the Cartagena Protocol and the Supplementary Protocol, as well as the pertinent rules of customary international law. Consequently, the law of state responsibility is of 'continuing significance'.[641]

639 *Phoebe N. Okowa*, Responsibility for Environmental Damage, in: Malgosia A. Fitzmaurice/David Ong/Panos Merkouris (eds.), Research Handbook on International Environmental Law (2010) 303, 317.

640 See chapter 5.

641 *Boyle/Redgwell* (n. 425), 247.