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**THE NO-HARM RULE: A POTENTIAL GAME
CHANGER FOR INTERNATIONAL CLIMATE
CHANGE GOVERNANCE?**

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Abstract

Climate change is presenting an existential threat to our world as we know it. Yet, the international community has thus far failed to enact adequate climate policies to combat this threat. This paper explores how a rule of international environmental law, the no-harm rule, could strengthen the international climate change response. It argues that the no-harm rule has a critical role to play in combatting dangerous anthropogenic climate change by demanding individual state responsibility for climate change-related damages. This is particularly so considering the inadequacies of current collective efforts being made under the UNFCCC framework, as well as the threat posed by the possible deployment of geoengineering technologies. Acknowledging that there are many challenges in applying the no-harm rule in the climate change context – namely, those of proving causation of harm, determining remedial obligations, and enforcing the rule – this paper contends that these challenges are surmountable, and indeed should be surmounted for the no-harm rule to fulfil its potential as a game changer in the international climate change regime.

Key terms: ‘climate change’, ‘no-harm rule’, ‘UNFCCC’, ‘geoengineering’.

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I Introduction

One of the greatest challenges currently facing our world is climate change. Human activity is rapidly warming global temperatures, resulting in catastrophic environmental changes, such as sea-level rise, more frequent extreme weather events, ocean acidification and natural disasters.¹ Yet, although the international community has been cognisant of the threat posed by climate change since, at the latest, the 1980s,² states have failed to respond with adequate climate policies to protect our planet.³ International efforts have thus far been channelled through the United Nations Framework Convention on Climate Change (UNFCCC) and related instruments, the focus of these instruments being the collective responsibility of the international community for climate protection.⁴ However, what has been lacking is state accountability for contributions to climate change. States have thus far displayed merely “lip service” in the fight to protect our planet.⁵ The policies currently implemented by states globally suggest that we are being fast tracked towards dangerous, irreversible climate change.⁶ States evidently need stronger individual incentives to make necessary environmental policy changes. To respond to this need international environmental law arguably already has an answer: the so-called no-harm rule.

¹ V Masson-Delmotte and others *Climate Change 2021: The Physical Science Basis, Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, Cambridge, 2021) at 6; and Shirley V Scott “Climate Change and Peak Oil as Threats to International Peace and Security: Is it Time for the Security Council to Legislate?” (2008) 9 *Melbourne Journal of International Law* 495 at 504.

² “The changing atmosphere: Implications for global security” (Conference Statement, Toronto, 27-30 June, 1988) at 292.

³ IPCC “Summary for Policymakers” in Priyadarshi R Shukla and others *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, Cambridge, 2022); and World Meteorological Organisation and others *United In Science 2021: A multi-organisation high-level compilation of the latest climate science information* (World Meteorological Organisation, 2021).

⁴ Paris Agreement (opened for signature 22 April 2016, entered into force 4 November 2016); and United Nations Framework Convention on Climate Change (opened for signature 4 June 1992, entered into force 21 March 1994).

⁵ Climate Action Tracker “Glasgow’s 2030 credibility gap: net zero’s lip service to climate action” (November 2021) <climateactiontracker.org>.

⁶ IPCC, above n 3; and Climate Action Tracker “Temperatures” (November 2021) <climateactiontracker.org>.

The no-harm rule is a normative cornerstone of international environmental law aimed at preventing transboundary environmental harm.⁷ It provides a mechanism for holding states responsible for any failure to prevent activities conducted on their territory from causing significant harm elsewhere.⁸ Yet, the no-harm rule is yet to be applied in the climate change context. This paper argues that the no-harm rule offers both a useful and a necessary tool for combatting dangerous anthropogenic climate change. Particularly considering the inadequacies of current international efforts being made under the UNFCCC framework, as well as the threat posed by the possible deployment of geoengineering technologies, the time is ripe for states to be held individually responsible for the climate change-related harms they cause. The no-harm rule would enable this. While challenges in applying the no-harm rule to climate change cases⁹ evidently exist, this paper argues that these challenges are surmountable and will only become easier to address thanks to continuously developing science.

This paper begins with an outline of the no-harm rule in Part II. Part III explores the role of the no-harm rule in the climate change context to date. Part IV sets out the reasons why the no-harm rule is a pertinent tool for combatting climate change, noting the failures of international climate change efforts thus far and exploring the threat posed by unregulated geoengineering technologies. Parts V-VII discuss the challenges that arise when applying the no-harm rule to climate change cases – namely, those related to proving causation, determining appropriate remedial obligations, and enforcing the no-harm rule – and suggest how each of these challenges can be overcome. Through this discussion it is shown that the potential of the no-harm rule to incentivise greater international climate action will only continue to grow.

⁷ *Case Concerning Pulp Mills on the River Uruguay (Argentina v Uruguay) (Judgement)* ICJ, 20 April 2010; “Declaration of the United Nations Conference on the Human Environment” in *Report of the United Nations Conference on the Human Environment A/CONF.48/14* (1972), Principle 21; and International Law Commission *Prevention of Transboundary Harm from Hazardous Activities* (Draft Articles, 2001), art 3.

⁸ *Case Concerning Pulp Mills on the River Uruguay*, above n 7; “Declaration of the United Nations Conference on the Human Environment”, above n 7, Principle 21; and International Law Commission, above n 7, art 3.

⁹ For the purposes of this paper, the phrase “climate change cases” encapsulates any legal disputes that may arise in the climate change context. This extends beyond merely climate change litigation.

II Understanding the no-harm rule

A foundational rule of international environmental law,¹⁰ the no-harm rule has a rich history governing international environmental issues. The no-harm rule developed from the common law principle *sic utere tuo ut alienum non laedas*, which requires that one's territory not be used to harm another.¹¹ It is a due diligence obligation, requiring that states undertake all reasonable steps to ensure that transboundary harm from activities carried out within their jurisdiction is prevented.¹² As such, the obligation is one of conduct, not result.¹³ Provided that all necessary preventative measures are taken to prevent transboundary harm,¹⁴ a state will be found to have complied with the no-harm rule, even if harm nonetheless results.

Now considered a “cornerstone of international environmental law”,¹⁵ the no-harm rule is deeply intertwined with the fundamental sovereign equality of states.¹⁶ At the core of this concept is the absolute equality of states.¹⁷ Each state has equal rights and duties under international law.¹⁸ The no-harm rule is a necessary corollary of this principle. Refraining from activities that risk significantly harming the territory, environment, or development of other states is a necessary obligation assumed by states to respect the territorial integrity of others.¹⁹

¹⁰ Philippe Sands and Jacqueline Peel *Principles of International Environmental Law* (3rd ed, Cambridge University Press, Cambridge, 2012) at 191.

¹¹ Marte Jervan *The Prohibition of Transboundary Environmental Harm. An Analysis of the Contribution of the International Court of Justice to the Development of the No Harm Rule* (PluriCourts Research Paper No. 14-17, 2014) at 1.

¹² *Case Concerning Pulp Mills on the River Uruguay*, above n 7; “Declaration of the United Nations Conference on the Human Environment”, above n 7, Principle 21; and International Law Commission, above n 7, art 3. For in-depth discussion of due diligence obligations in general public international law, see Alice Ollino *Due Diligence Obligations in International Law* (Cambridge University Press, Cambridge, 2022).

¹³ Ellen Hey “Principles” in *Advanced Introduction to International Law and the Environment* (Edward Elgar, Cheltenham, 2016) at 4.5.1.

¹⁴ What measures are considered necessary varies on a case-by-case basis.

¹⁵ Sands and Peel, above n 10, at 191.

¹⁶ Jervan, above n 11, at 16; Benoît Mayer “Construing International Climate Change Law as a Compliance Regime” (2018) 7 *Transnatl Environ Law* 115 at 120.

¹⁷ Charter of the United Nations, art 2(1); and Jervan, above n 11, at 16.

¹⁸ Jervan, above n 11, at 16.

¹⁹ Mayer, above n 16, at 120.

A Development: the no-harm rule's evolved scope and status

The no-harm rule was first applied in the *Trail Smelter case*.²⁰ At issue was Canada's responsibility for atmospheric emissions stemming from a privately-owned Canadian smelter that were damaging United States' crops and farmland. In finding that Canada was responsible for the damage to United States' territory caused by the smelter, the arbitral tribunal declared that:²¹

...no state has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury has been established by clear and convincing evidence.

Though the *Trail Smelter case* was a dispute between neighbouring states, the rule formulated by the tribunal subsequently evolved to require the prevention of harm to any other state,²² as well as to areas beyond national jurisdiction (e.g., the high seas and outer space).²³

The *Corfu Channel* case was the first to expand the no-harm rule's scope.²⁴ There, the International Court of Justice (ICJ) found Albania liable for damage to British warships that had occurred when the ships struck mines while passing through Albanian territorial waters.²⁵ The Court affirmed the obligation on all states not to knowingly allow their territory to be used in a manner likely to negatively impact the rights of other states.²⁶ In doing so, the Court expanded the scope of the no-harm rule to apply between all states, and also found that the rule can be violated by both acts and omissions, suggesting that the obligation imposed on states by the no-harm rule is a positive one.²⁷

²⁰ *Trail Smelter case (US v Canada)* [1952] 3 UNRIAA 1905.

²¹ At 1965.

²² *Corfu Channel (United Kingdom v Albania) (Merits)* [1949] ICJ Rep 4 at 22.

²³ Convention on Biological Diversity (opened for signature 5 June 1992, entered into force 29 December 1993), art 3; "Declaration of the United Nations Conference on the Human Environment", above n 7, Principle 21; "Rio Declaration on Environment and Development" in *Report of the United Nations Conference on Environment and Development* Annex I, A/CONF.48/14 (1992), Principle 2; and United Nations Framework Convention on Climate Change, above n 4, preamble.

²⁴ *Corfu Channel*, above n 22, at 22.

²⁵ At 4, 10, 12-13.

²⁶ At 22.

²⁷ At 23.

Application of the no-harm rule in international documents and agreements further expanded its scope to areas beyond national jurisdiction. The Declaration of the United Nations Conference on the Human Environment 1972 (Stockholm Declaration) was the first example of this. Principle 21 of the Stockholm Declaration holds that:²⁸

States have the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

Virtually identical language was adopted in the preamble to the UNFCCC,²⁹ art 3 of the Convention on Biological Diversity 1993,³⁰ and in Principle 2 of the Rio Declaration on Environment and Development 2002,³¹ evidencing widespread international acceptance of the no-harm rule and its expansive scope.

The no-harm rule has now clearly crystallised as customary international law. Besides its reflection in numerous international agreements, the rule's customary status has been affirmed by the ICJ on many occasions as part of the "corpus of international law".³² In confirming this, the ICJ in *Pulp Mills* emphasised the positive nature of the obligation of due diligence inherent in the no-harm rule, finding that a state is "obliged to use all the means at its disposal" to avoid significant transboundary harm from eventuating from activities conducted on its territory.³³

B Requirements

To invoke the no-harm rule, a claimant state must be able to meet the threshold conditions of harm, prove a causal connection between the harm and the activities occurring within the jurisdiction of a specific state, and show that that state failed to meet the due diligence

²⁸ "Declaration of the United Nations Conference on the Human Environment", above n 7, Principle 21 (emphasis added).

²⁹ United Nations Framework Convention on Climate Change, above n 4, preamble.

³⁰ Convention on Biological Diversity, above n 23, art 3.

³¹ "Rio Declaration on Environment and Development", above n 23, Principle 2.

³² *Case Concerning Pulp Mills on the River Uruguay*, above n 7, at [101]; *Gabčíkovo-Nagymaros Project (Slovakia v Hungary) (Judgment) (Merits)* [1997] ICJ Rep 88 at [53]; and *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)* [1996] ICJ Rep 226 at 29.

³³ *Case Concerning Pulp Mills on the River Uruguay*, above n 7, at [101].

obligations required of it.³⁴ As will be discussed, each of these requirements has evolved over time through judicial application.

Three threshold conditions must first be met to invoke the no-harm rule: environmental harm must have resulted from human activities, that harm must cross international boundaries, and the harm must be significant and substantial.³⁵ What constitutes the latter condition, “significant” harm, has not always been clear. The *Trail Smelter case* held that this threshold will be met where “clear and convincing evidence” establishes that a situation risks injury of “serious consequence” to another state’s territory, people, or property.³⁶ More recently, this condition has evolved to comply with the precautionary approach, which holds that scientific uncertainty surrounding a potentially significant environmental threat cannot be used to justify inaction in preventing the threat from eventuating.³⁷ This approach has been endorsed by the ICJ, who noted the possibility of the precautionary approach crystallising as customary international law in the near future.³⁸ Consistent with this approach, the threshold for invoking the no-harm rule is therefore likely to be met where there is more than trivial evidence that serious transboundary harm has resulted from a state’s activities, even if the risk of such harm occurring was not scientifically certain.

Once the threshold conditions of harm have been met, a causal connection between that harm and the activities of a specific state must be established, as well as a failure by that state to take all reasonable preventative measures to stop the harm from occurring.³⁹ Difficulties with proving causation will be addressed later in this paper. As for whether a state failed to take adequate measures to prevent the occurrence of transboundary harm, the due diligence required

³⁴ Benoît Mayer “The relevance of the no-harm principle to climate change law and politics” (2016) 19 Asia Pac J Environ Law 79.

³⁵ Oscar Schachter “The Emergence of International Environmental Law” (1991) 44 J Int Aff 457.

³⁶ *Trail Smelter case*, above n 19.

³⁷ “Rio Declaration on Environment and Development”, above n 23, Principle 15; Convention on Biological Diversity, above n 23, preamble.

³⁸ *Case Concerning Pulp Mills on the River Uruguay*, above n 7; *Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area (Advisory Opinion)* ITLOS 17, 1 February 2011 at [135].

³⁹ Mayer, above n 34.

varies between cases.⁴⁰ The prevention principle holds that higher due diligence is required for activities bearing greater risks, particularly when conducted in vulnerable environments, than for less risky activities carried out in less vulnerable environments.⁴¹ Additionally, while the exact preventative measures adopted may often be left at the state's discretion, if there is scientific consensus that a certain preventative measure is the most effective in mitigating the relevant risk of harm, that measure may be required.⁴² The capacity of the state will also be considered in determining the level of due diligence required.⁴³ Greater preventative efforts will be expected of developed states that have greater means of preventing transboundary harm. Ultimately, the standard of due diligence required will be that which would be expected of a reasonable government in comparable circumstances.⁴⁴

If a breach of the no-harm rule is proven, the state in breach will attract liability under the laws of state responsibility, as outlined in the ILC Draft Articles on Responsibility of States for Internationally Wrongful Acts.⁴⁵ The liable state must both cease the activity causing transboundary harm and make reparation for the harm caused.⁴⁶ How these remedial obligations apply in cases involving environmental harm will be explored later.

III The current role of the no-harm rule in the climate change context

Having crystallised as a customary rule of international environmental law, it might logically be expected that the no-harm rule has played a central role in governing climate change matters, holding states liable for the harmful transboundary impacts of their emissions. Yet, in practice, the no-harm rule has assumed no such role. The rule has not been applied to climate change matters for various reasons. For one, the complexity of climate change-related issues both

⁴⁰ Hey, above n 13, at 4.5.1.

⁴¹ At 4.6.1.

⁴² At 4.6.1.

⁴³ Akiko Takano, "Due Diligence Obligations and Transboundary Environmental Harm: Cybersecurity Applications" (2018) 7 MDPI Laws 36.

⁴⁴ Alistair Rieu-Clarke, Ruby Moynihan and Bjørn-Oliver Magsig *UN Watercourses Convention: User's Guide* (IHP-HELP Centre for Water, Law, Policy and Science, 2012) at 119.

⁴⁵ International Law Commission *Draft Articles on Responsibility of States for Internationally Wrongful Acts* (Draft Articles, 2001), art 1.

⁴⁶ Articles 30 and 31.

causally and temporally makes application of the no-harm rule challenging.⁴⁷ Key challenges in its application relate to the need to establish a clear causal link between emitting activities and specific harm, the complexities in determining appropriate remedial obligations for liable states, and the challenge of enforcing state responsibility, among other things.⁴⁸ While these challenges are arguably surmountable (as this paper will argued in later parts) and could be clarified by international legal bodies,⁴⁹ political unwillingness for any such development has thus far prevented this.⁵⁰ The political unwillingness of powerful, high-emitting states to both discuss and develop the no-harm rule in the climate change context, bolstered by the arguments of some academics that the no-harm rule does not apply to climate change-related matters,⁵¹ has resultantly prevented the no-harm rule from having any material effect in combatting climate change.

A Hindrances to the no-harm rule's development

As the severity of the climate crisis has become more apparent in recent years, attempts have been made by a number of states to clarify the liability of high-emitting states under international environmental law for their harmful emissions. Efforts have included requests for an ICJ advisory opinion to clarify states' international obligations in the climate change

⁴⁷ Hannah Stallard "Turning up the Heat on Tuvalu: An Assessment of Potential Compensation for Climate Change Damage in Accordance with State Responsibility under International Law" (2009) 15 *Canterbury L Rev* 163 at 170; and Roda Verheyen *Climate Change Damage and International Law: Prevention Duties and State Responsibility* (Martinus Nijhoff Publishers, Leiden, 2005) at 312.

⁴⁸ Kerry Brent, Jeffrey McGee and Amy Maguire "Does the 'No-Harm' Rule Have a Role in Preventing Transboundary Harm and Harm to the Global Atmospheric Commons from Geoengineering?" (2015) 5 *Clim Law* 35 at 38 and 52-53; Maciej Nyka "State Responsibility for Climate Change Damages" (2021) 2 *RECIEL* 131 at 145; Verheyen, above n 47, at 232-256.

⁴⁹ For example, by the ICJ via an advisory opinion, or by the International Law Commission, who created the Draft Articles on Prevention of Transboundary Harm from Hazardous Activities 2001. See International Law Commission, above n 7.

⁵⁰ Benoît Mayer "Climate change reparations and the law and practice of state responsibility" (2017) 7 *Asian J Int Law* 185 at 191-192; and Koko Warner and Sumaya Ahmed Zakieldean *Loss and Damage Due to Climate Change: An Overview of the UNFCCC Negotiations* (European Capacity Building Initiative, Oxford, 2012) at 3.

⁵¹ See for example Alexander Zahar "Methodological issues in climate law" (2015) 5 *Clim Law* 25.

context,⁵² as well as efforts to have key principles of international environmental law, of which the no-harm rule is one, clarified by an UN-organised working group.⁵³

Two notable attempts at seeking an ICJ advisory opinion on states' climate-related environmental obligations have so far been made. First, in 2011, Palau announced plans to seek an advisory opinion from the ICJ to clarify states' obligations under international environmental law, as they apply to climate change.⁵⁴ Specifically, Palau intended to ask the Court whether states are legally responsible for ensuring that any activities on their territory that emit GHGs do not seriously harm other states.⁵⁵ The question thus spoke directly to the no-harm rule and would have clarified how the rule applies when climate-related harms are at issue. However, an advisory opinion never eventuated. Palau was forced to withdraw its application to the ICJ following significant diplomatic pressure from the United States.⁵⁶

More recently, the quest for legal clarification from the ICJ has been reignited. Vanuatu and other Pacific Island nations have announced plans to seek an ICJ advisory opinion to clarify the legal obligations of all states to prevent and remedy the adverse effects of climate change.⁵⁷ Though the question being asked of the Court does not directly speak to the no-harm rule, this principle will no doubt be relevant for the ICJ to consider and clarify in its opinion. As the announcement of this initiative is still relatively recent, it remains to be seen whether it will be stonewalled, as Palau's efforts were, by larger world powers. However, immense support of

⁵² United Nations "Palau seeks UN World Court opinion on damage caused by greenhouse gases" (22 September 2011) <news.un.org>; and Vanuatu ICJ Initiative "The Republic of Vanuatu: Pursuing an Advisory Opinion on Climate Change from the International Court of Justice" (2022) <vanuatuicj.com>.

⁵³ *Report of the ad hoc open-ended working group established pursuant to General Assembly resolution 72/277* UN Doc A/AC.289/6/Rev.1 (2019); and *Towards a Global Pact for the Environment* GA Res 72/277 (2018).

⁵⁴ United Nations, above n 52.

⁵⁵ United Nations, above n 52.

⁵⁶ Stuart Beck and Elizabeth Burleson "Inside the System, Outside the Box: Palau's Pursuit of Climate Justice and Security at the United Nations" (2014) 3 *Transnatl* 17 at 26.

⁵⁷ Amy Gunia "Pacific Island Nations Are Bringing Their Climate Justice Fight to the World's Highest Court" (18 July 2022) *Time* <time.com>; Climate Home News "Island States back Vanuatu's quest for climate justice at the UN" (24 May 2022) <climatechangenews.com>; and Vanuatu ICJ Initiative, above n 52.

Vanuatu's initiative has been expressed by civil society, suggesting that quashing the initiative may be a much greater political challenge this time.⁵⁸

Another opportunity for clarification of the no-harm rule as it should apply in cases concerning climate-related harms was the Global Pact for the Environment initiative. In 2018, a United Nations General Assembly resolution led to the establishment of a working group to consider options for addressing gaps in international environmental law relevant to climate change.⁵⁹ The no-harm rule was one of the principles to be reviewed by the working group. However, during the process, it was recommended that no further negotiations on the no-harm rule were necessary, so the rule was taken off the table for review.⁶⁰ Instead, the process evidenced the deliberate evasion of the no-harm rule in the climate change context by powerful, high-emitting states, which is arguably attributable to the fears of such states about the implications that clarification of the rule might have for their emitting practices.⁶¹

B Applicability of the no-harm rule in the climate change regime

That the no-harm rule has not been applied in climate change matters thus far is considered by some scholars to be the correct approach, arguing that the no-harm rule does not apply in the climate change context.⁶² This argument is based on the *lex specialis* doctrine, which holds that in situations where two different laws may apply, the law specifically designed for the relevant subject matter (*lex specialis*) should prevail over general law (*lex generalis*), except where a peremptory norm is at play.⁶³ Therefore, as the international community has created a

⁵⁸ Lagipoiva Chelle Jackson "Vanuatu's push for legal protection from climate change wins crucial support" (10 May 2022) The Guardian <theguardian.com>.

⁵⁹ *Report of the ad hoc open-ended working group established pursuant to General Assembly resolution 72/277*, above n 53; and *Towards a Global Pact for the Environment*, above n 53.

⁶⁰ *Follow-up to the report of the ad hoc open-ended working group established pursuant to General Assembly resolution 72/277* GA Res 73/333 (2019); and *Report of the ad hoc open-ended working group established pursuant to General Assembly resolution 72/277*, above n 53.

⁶¹ Joyeeta Gupta and Susanne Scheimer "Future proofing the principle of no significant harm" (2020) 20 Int Environ Agreements 731 at 739; and Sands and Peel, above n 10, at 151.

⁶² Zahar, above n 51.

⁶³ A peremptory norm is a legal principle that the international community considers to be so fundamental that no derogation from it shall be allowed. *Case concerning United States Diplomatic and Consular Staff in Tehran (United States of America v Iran)* [1980] ICJ Rep 3; Florentina Simlinger and Benoît Mayer "Legal Responses

specific legal regime for climate change governance, customary international law will not apply if it is considered to conflict with these specific laws, as set out in the UNFCCC, the Paris Agreement, and related instruments.⁶⁴ On this basis, Zahar has argued that the no-harm rule does not apply in cases where transboundary harm has resulted from a state's emissions, as states' emissions are instead governed by laws developed within the UNFCCC framework.⁶⁵

The argument that the UNFCCC framework prevents the application of the no-harm rule in climate change-related cases is flawed. The ILC has clarified that for customary law to be set aside, it will not suffice that customary law and specific law cover the same subject matter.⁶⁶ For the *lex specialis* doctrine to apply, the two laws in question must be inconsistent, or there must be a clear intention that the specific law was intended to exclude the general law.⁶⁷ Neither of these conditions have been met as regards the alleged conflict between the no-harm rule and UNFCCC instruments. Firstly, parties to the UNFCCC did not agree to exclude the application of customary international law to climate change disputes.⁶⁸ To the contrary, a number of states made statements upon signature of the UNFCCC that the UNFCCC and successive agreements would not derogate from the application of customary international law, particularly the laws of state responsibility.⁶⁹ Additionally, the no-harm rule is included in the preamble to the UNFCCC, suggesting that signatory states acknowledge its existence and implications.⁷⁰ Secondly, the no-harm rule does not conflict with the UNFCCC and related instruments. While both laws seek to protect the environment from anthropogenic harm, they serve different purposes. The no-harm rule addresses liability for transboundary harm, while the UNFCCC framework avoids any mention of liability, neither implying nor excluding the

to Climate Change Induced Loss and Damage” in Reinhard Mechler and others (eds) *Loss and Damage from Climate Change* (Springer, Cham, 2019) 179; Mayer, above n 16; and Verheyen, above n 47.

⁶⁴ Paris Agreement, above n 4; United Nations Framework Convention on Climate Change, above n 8; *Case concerning United States Diplomatic and Consular Staff in Tehran*, above n 63; Verheyen, above n 47.

⁶⁵ Zahar, above n 51.

⁶⁶ International Law Commission *Draft Articles on Responsibility of States for Internationally Wrongful Acts, with commentaries* (2001), commentary under art 55 at [4]; *Mavrommatis Palestine Concessions (Greece v United Kingdom)* (1924) PCIJ 3 at 31.

⁶⁷ International Law Commission, above n 66, commentary under art 55 at [4].

⁶⁸ Mayer, above n 16; and Verheyen, above n 47.

⁶⁹ Kiribati, Fiji, and Nauru *Declarations upon signature of the UNFCCC* 1771 UNTS 317-318 (1992); United Nations Climate Change “Declarations by Parties” <unfccc.int>; and Verheyen, above n 47, at 143.

⁷⁰ United Nations Framework Convention on Climate Change, above n 4, preamble.

possibility that state responsibility might result should a state's emissions cause significant harm.⁷¹ Absent any conflict between these two legal commitments, the no-harm rule and the UNFCCC framework should be interpreted consistently alongside each other.⁷² Accordingly, the no-harm rule can be seen as filling a void left open by the current climate change regime regarding state responsibility for climate change damage.

IV The pertinence of the no-harm rule in combatting anthropogenic climate change

Despite the minimal role that the no-harm rule has played in the climate change regime so far, the rule offers a promising tool for combatting dangerous anthropogenic climate change. As attribution science improves and, accordingly, so does the applicability of the no-harm rule, the rule could fill the accountability gap presently lacking from the UNFCCC and the Paris Agreement. The rule also offers a legal mechanism for monitoring the use of geoengineering technologies, which presents a growing, unregulated risk. This section explores these areas in which the no-harm rule could be a legal game-changer.

A The need for stronger state accountability

Thus far, the international community has responded to the climate crisis with a collection of treaties (the UNFCCC and related instruments) that seek to combat anthropogenic climate change by facilitating international cooperation on the matter.⁷³ The Paris Agreement sets out how the international community plans to prevent dangerous anthropogenic climate change. The Agreement's goal is to limit global warming to well below 2°C above pre-industrial levels, ideally limiting average global temperature increase to 1.5°C.⁷⁴ To achieve this, each state is expected to make a nationally determined contribution (NDC) to the global climate change response that should reflect ambitiousness, while taking into account state capacity.⁷⁵ This

⁷¹ Mayer, above n 16, at 126.

⁷² Mayer, above n 16; and Simlinger & Mayer, above n 63.

⁷³ Paris Agreement, above n 4, art 2; and United Nations Framework Convention on Climate Change, above n 4, arts 2, 3 and 4.

⁷⁴ Paris Agreement, above n 4, art 2(a).

⁷⁵ Articles 3 and 4.

bottom-up approach relies on the honest efforts of states to undertake their best possible efforts to combat climate change.⁷⁶

While much hope was placed in the Paris Agreement at its inception,⁷⁷ it is becoming increasingly evident that it has not yet resulted in sufficient action to prevent dangerous anthropogenic climate change. Seven years on from the signing of the Paris Agreement, global temperatures have continued to skyrocket.⁷⁸ Average annual GHG emissions have been higher in the past decade than any other, and are increasing.⁷⁹ Based on states' current NDCs, it is predicted likely that global average temperatures will reach 2.4°C above pre-industrial levels, while state policies actually implemented suggest that global temperatures are likely to increase at an even faster trajectory, reaching approximately 2.7°C above pre-industrial levels.⁸⁰ Already within the next five years, average global temperature threatens to surpass the 1.5°C goal.⁸¹ Climate change is evidently not being combatted at a fast enough rate. The international approach set out by the UNFCCC and Paris Agreement are proving insufficient to prevent dangerous anthropogenic climate change. This being so, while these measures should not be abandoned, additional mechanisms are necessary.

The no-harm rule has the potential to increase the efficacy of international climate change efforts by filling an accountability gap. The UNFCCC and Paris Agreement take a collective approach to climate change responsibility; the international community as a whole is considered responsible for climate change and its impacts.⁸² While this makes sense from the perspective that climate change is a collective action problem,⁸³ the problem with this

⁷⁶ Jen Iris Allan "Dangerous Incrementalism of the Paris Agreement" (2019) 19 *Glob Environ Polit* 4 at 5 and 7-7.

⁷⁷ Patricia Espinosa, Executive Secretary of the United Nations Framework Convention on Climate Change "The Paris Agreement, an Agenda for Transformation" (Speech, Faculty of Economics and Business at the University of Oviedo, Oviedo, 21 October 2016).

⁷⁸ World Meteorological Organisation and others, above n 3.

⁷⁹ IPCC, above n 3, at 10.

⁸⁰ Climate Action Tracker, above n 6.

⁸¹ World Meteorological Organisation and others, above n 3.

⁸² Paris Agreement, above n 4, art 2; and United Nations Framework Convention on Climate Change, above n 4, preamble.

⁸³ A collective action problem is a problem that can only be resolved by the collective efforts of all involved actors. However, cooperation is hard to achieve in these problems because of conflicting individual interests that

approach, as shown by states' present emitting practices, is that states are not individually willing to make the necessary sacrifices for the collective to protect the climate. Until states are held individually accountable for their excessive emitting practices, it is likely that they will continue to fall short in meeting their climate goals. The no-harm rule could rectify this. It provides a way to hold states individually accountable for excessive emissions where the state has the capabilities to reduce their emissions or limit the impact that their emissions would have on the environment but failed to do so. By adding this element of individual liability for negligent emitting practices to the climate regime, states should be incentivised to truly make their best possible efforts to combat climate change.

B The geoengineering threat

Accompanying the risks presented by states' increasing GHG emissions are the risks associated with mechanisms for counteracting such emissions. Geoengineering technologies, which aim to manipulate the environment on a global scale to offset some of the impacts of climate change,⁸⁴ are increasingly being considered by members of the international community as a mechanism for combatting dangerous anthropogenic climate change.⁸⁵ Geoengineering technologies come in many forms, presenting different levels of risk.⁸⁶ However, what they have in common is the intent to manipulate the environment to prevent global temperatures from rising, which necessarily entails the risks that environmental manipulation may have harmful impacts on the environment (as well as useful ones), or that these technologies may simply fail.⁸⁷ There is presently no international legal regime governing the use of geoengineering technologies. While a specific regime is needed, the no-harm rule is arguably a pertinent tool that can be applied to govern the use of geo-engineering technologies.

discourage collective action in the short-term term. See Steven R Brechin "Climate Change Mitigation and the Collective Action Problem: Exploring Country Differences in Greenhouse Gas Contributions" (2016) 31 *Social Forum* 846.

⁸⁴ Harvard's Solar Geoengineering Research Program "Geoengineering" Harvard University <geoengineering.environment.harvard.edu>; and Oxford Geoengineering Programme "What Is Geoengineering?" <geoengineering.ox.ac.uk>.

⁸⁵ Karen N Scott "International Law in the Anthropocene: Responding to the Geoengineering Challenge" (2013) 34 *Mich J Int Law* 309 at 310-311 and 320.

⁸⁶ At 321-329.

⁸⁷ Andrew Ross and H Damon Matthews "Climate Engineering and the Risk of Rapid Climate Change" (2009) 4 *Environ Res Lett* 045103 at 4.

1 *The risks of geoengineering*

Geoengineering activities can be classified into two categories: carbon dioxide removal (CDR) and solar radiation management (SRM). CDR seeks to remove carbon dioxide from the atmosphere, either by manipulating the efficacy of natural carbon sinks or creating artificial ones.⁸⁸ This may be as simple as strategizing afforestation, or may involve more complex processes such as soil-carbon sequestration, the use of algae on building surfaces to absorb carbon dioxide, or fertilising the ocean with iron to prompt algal blooms.⁸⁹ While afforestation or reforestation strategies are largely uncontroversial and already being used as a natural carbon capture mechanism with predictable impacts, other mechanisms pose greater risks.⁹⁰ For example, the outcomes of iron fertilisation in the ocean are unpredictable and risk disrupting marine ecosystems, increasing ocean acidification, and increasing the emissions of nitrous oxide and other GHGs, among other possible effects.⁹¹

The other category of geoengineering technologies, SRM, aims to reflect solar radiation away from the earth to artificially cool the planet.⁹² The two most studied methods proposed to achieve this are stratospheric aerosol injection (SAI), which involves injecting tiny reflective aerosols into the atmosphere to reflect sunlight,⁹³ and marine cloud brightening (MCB), which

⁸⁸ Scott, above n 85, at 321.

⁸⁹ Eduardo Jacob-Lobes and others “Rates of CO₂ Removal by *Aphanothece* Microscopic *Nägeli* in Tubular Photobioreactors” (2008) 47 *Chem Eng Process* 1365 at 1372; Massimo Tavoni, Brent Sohngen and Valentina Bosetti “Forestry and the Carbon Market Response to Stabilise Climate” (2007) 35 *Energy Policy* 5346 at 5346; and Raj K Shrestha and Rattan Lal “Ecosystem Carbon Budgeting and Soil Carbon Sequestration in Reclaimed Mine Soil” (2006) 32 *Environ Int* 781 at 782.

⁹⁰ Scott, above n 85, at 321-323.

⁹¹ CS Law “Predicting and Monitoring the Effects of Large-Scale Ocean Iron Fertilisation on Marine Trace Gas Emissions” (2008) 264 *Mar Ecol Prog Ser* 283 at 284-6; Doug Wallace and others *Ocean Fertilisation: A Scientific Summary for Policy Makers* (Intergovernmental Oceanographic Commission, 2010) at 7; John J Cullen & Phillip W Boyd “Predicting and Verifying the Intended and Unintended Consequences of Large-Scale Iron Fertilisation” (2008) 364 *Mar Ecol Prog Ser* 295 at 296; and Secretariat of the Convention on Biological Diversity *Scientific Synthesis of the Impacts of Ocean Fertilisation on Marine Biodiversity* 9 (CBD Technical Series No. 45, 2009) at 23.

⁹² Scott, above n 85, at 321.

⁹³ Paul J Crutzen “Albedo Enhancement by Stratospheric Sulfur Injections: A Contribution to Resolve a Policy Dilemma?” (2006) 77 *Climatic Change* 211 at 211.

would brighten the clouds to make them more reflective.⁹⁴ Unlike with many CDR strategies, the consequences of SRM are unpredictable.⁹⁵ This is because SRM does not alter atmospheric GHG concentrations. SRM instead intentionally decouples atmospheric GHG concentrations from the earth's surface temperatures, reducing the latter without addressing the former.⁹⁶ The effects of altering this relationship are unknown and the anticipated risks are vast. SAI has the potential to alter rainfall and monsoon patterns (particularly in Africa and Asia), having flow on effects for food and water security.⁹⁷ SAI would also risk further stratospheric ozone layer depletion,⁹⁸ contributing to an already significant environmental problem.⁹⁹ Further, because SRM fails to address the cause of climate change (anthropogenic GHG emissions), should SRM techniques fail or be terminated at any stage, global temperatures will likely rise rapidly as concentrations of GHG emissions will have only increased in the time following SRM deployment.¹⁰⁰ Not only would the resulting increased temperatures have detrimental impacts on the climate, but the environmental impacts would likely be significantly more severe as ecosystems would not have had time to gradually adapt to global temperature changes.¹⁰¹

⁹⁴ At 211-212; and John Latham and others "Global Temperature Stabilisation via Controlled Albedo Enhancement of Low-Level Maritime Clouds" (2008) 366 *Philos Trans R Soc* 3969 at 3969.

⁹⁵ H Damon Matthews and Ken Caldeira "Transient Climate-Carbon Simulations of Planetary Geoengineering" (2007) 104 *PNAS* 9949 at 9952; and Scott, above n 85, at 326.

⁹⁶ Scott, above n 85, at 326.

⁹⁷ Alan Robock and others "Regional Climate Responses to Geoengineering with Tropical and Arctic SO₂ Injections" (2008) 113 *J Geophys Res* at 1; Alan Robock "Stratospheric Aerosol Geoengineering" in Roy Harrison and Ron Hester (eds) *Geoengineering of the Climate System* (The Royal Society of Chemistry, Cambridge, 2014) 162 at 174-176; and The Royal Society *Geoengineering the climate: science, governance and uncertainty* (The Royal Society, London, 2009) at 31.

⁹⁸ P Heckendorn and others "The Impact of Geoengineering Aerosols on Stratospheric Temperature and Ozone" (2009) 4 *Environ Res Lett* 045108; Robock, above n 97, at 167-168; and Simone Timmes and others "The Sensitivity of Polar Ozone Depletion to Proposed Geoengineering Schemes" (2008) 320 *Science* 1201 at 1204.

⁹⁹ Manufactured gases are already destroying ozone molecules, depleting the earth's ozone layer and therefore increasing the amount of harmful ultraviolet radiation entering the atmosphere. See Heckendorn and others, above n 98; and Sands and Peel, above n 10, at 262-264.

¹⁰⁰ At 326; The Royal Society, above n 97, at 243; and Victor Brovkin and others "Geoengineering Climate by Stratospheric Sulfur Injections: Earth System Vulnerability to Technological Failure" (2009) 92 *Clim Change* 243 at 243.

¹⁰¹ Ross and Damon Matthews, above n 87, at 4.

Evidently, the potential harms of geoengineering are both widespread and severe. That such activities are presently unregulated internationally means that, possibly, any one state or company may feel entitled to deploy geoengineering technologies at its will. However, this is where the no-harm rule steps in.

2 *The no-harm rule as a control on geoengineering deployment*

While there may not yet be any international legal regime specifically governing geoengineering, the no-harm rule, as customary international law, provides a control over large-scale geoengineering deployment. This is because the potential harms that geoengineering technologies may cause clearly meet the threshold conditions for invoking the no-harm rule. Firstly, geoengineering is a human activity. Secondly, whether it be the contribution of aerosol particles to the atmosphere, changes to precipitation patterns, ocean acidification, or global temperature change, the impacts of geoengineering cross international boundaries. Finally, almost all of the risks associated with large-scale geoengineering (the exceptions being afforestation and urban albedo enhancement) clearly reach the level of significant and substantial harm as they impact vital ecosystems and threaten critical resources.¹⁰² As such, the due diligence obligations required under the no-harm rule would apply to states considering undertaking geoengineering activities.

The importance of the no-harm rule in the geoengineering context cannot be understated. With no legal regime governing its use, geoengineering technologies may potentially be deployed unilaterally by one state, or by a group of states, who perceive geoengineering to be the solution to the climate change problem.¹⁰³ This would be particularly likely from states, or even companies or individuals within states, that may financially benefit from solving climate change technologically.¹⁰⁴ The no-harm rule puts restraints on such deployment, protecting the interests of other states who may otherwise be subjected to the risks of geoengineering without any say in the matter.

To meet the due diligence requirements of the no-harm rule, a state conducting an activity that risks a sufficient likelihood of damage must conduct an environmental impact assessment

¹⁰² Scott, above n 85, at 334.

¹⁰³ David G Victor “On the Regulation of Geoengineering” (2008) 24 Oxford Rev Econ Policy 322 at 324.

¹⁰⁴ Scott, above n 85, at 354.

(EIA) and must consult all potentially affected states prior to commencing the activity.¹⁰⁵ Such measures are necessary for a state to be able to prove that it honestly exerted its best possible efforts to prevent harm from occurring.¹⁰⁶ In the case of geoengineering, an EIA would almost certainly always be required, as environmental damage cannot be excluded as a possible outcome of the deployment of such technology.¹⁰⁷ International law does not set exact requirements as to an EIA's content and structure.¹⁰⁸ However, considering the large-scale danger risked by geoengineering, it can be assumed that an EIA in this context would have to be particularly rigorous.¹⁰⁹ The consultation obligation is also hugely beneficial for the international community. It ensures that they will be notified of any potential future use of geoengineering technologies, enabling them to comment on the risks of a specific project and, hopefully, influence whether or not it goes ahead. Ultimately, the no-harm rule requires that any state considering using geoengineering technologies must have duly considered the rights and territorial integrity of other states and the environment at large prior to commencing the proposed geoengineering activity.¹¹⁰ To act unilaterally, failing to consult in good faith with potentially impacted states and prevent injury to their interests, would be a clear violation of this due diligence obligation.¹¹¹ Though the no-harm rule may not be able to ultimately prevent the use of geoengineering technologies, it offers a useful starting mechanism for regulating large-scale geoengineering deployment. As such, this customary law must not be overlooked by the international community as a tool relevant in the climate change context.

V Challenge in application 1: Causation

The no-harm rule evidently has a pertinent role to play in the fight against anthropogenic climate change. Yet, the challenges that arise when applying the no-harm rule to climate

¹⁰⁵ Alexander Proelss "Geoengineering and International Law" (2012) 30 S+F 205 at 206; *Case Concerning Pulp Mills on the River Uruguay*, above n 7, at [24] and [80]; and "Rio Declaration on Environment and Development", above n 23, Principle 19.

¹⁰⁶ International Law Commission, above n 66, commentary under art 3 at [7]; *Case Concerning Pulp Mills on the River Uruguay*, above n 7, at [228]; Proelss, above n 105, at 206.

¹⁰⁷ Proelss, above n 105, at 206.

¹⁰⁸ *Case Concerning Pulp Mills on the River Uruguay*, above n 7, at [205].

¹⁰⁹ Proelss, above n 105, at 206.

¹¹⁰ At 209.

¹¹¹ At 209.

change-related matters cannot be overlooked. This part examines the first of three key challenges – proving causation – and discusses how this challenge can be overcome.

A The challenge

To find a state in breach of the no-harm rule, there must be a causal link between the environmental harm at issue and the specific activity/activities of that state.¹¹² To establish such a link, the harm at issue must have been a “proximate” and “foreseeable” consequence of the state’s activity, though the harm need not have been the determinate consequence.¹¹³ When climate-related harms are at issue, proving what specific activities caused the harm is particularly challenging. This is because rather than being definitively caused by a certain activity, climate-related harms result from the cumulative impact of GHG emissions on the Earth’s atmosphere.¹¹⁴ Climate-related harms are, as such, multi-directional, being contributed to by all states.¹¹⁵ Further adding to this complexity is the temporal aspect to climate change causation. While some climate-related harms may result quickly as a result of certain emitting practices, others occur gradually as the effects of state emissions compound.¹¹⁶ Where harm occurs more gradually, the possibility that the resulting harm was contributed to by multiple risk-bearing activities that might not have caused such harm on their own is heightened.

Considering that the consequences of climate change often occur in an indirect and remote way, the task of proving that a specific example of climate change-related harm resulted from one state’s high-emitting activity is incredibly challenging. For example, rising sea levels cannot be causally linked to one state’s high-emitting activity, instead being a large-scale consequence of the combined emissions of the international community. Further, proving causation becomes even more challenging where the harm at issue may have eventuated irrespective of climate change. For example, even though extreme weather events have been

¹¹² Mayer, above n 34, at 85.

¹¹³ In other words, the harm need not have been an absolutely predictable consequence of the activity in question. Rather, it must have been a viable possibility that such harm could result. See Mayer, above n 34, at 91; and International Law Commission, above n 66, commentary under art 31; and *Trail Smelter case*, above n 20, at 1931.

¹¹⁴ Mada Apriani and others “Exercising No Harm Rule: Claims for Damage and Loss Due Climate Change Effects” (2022) 6 SLRev 174 at 176; and Mayer, above n 34, at 85.

¹¹⁵ Gupta and Schmeier, above n 61, at 733.

¹¹⁶ At 733.

proven to be more likely because of climate change,¹¹⁷ it is very challenging to prove that any one extreme weather event would not have occurred but for climate change. Similarly, if the deployment of geoengineering technologies were to alter rainfall patterns in one part of the globe, it would be challenging to prove that this was a consequence of geoengineering, rather than being a naturally occurring weather event or even the result of other climate-related factors.

The impact of these challenges in attributing climate-related harm to state actions is that, to date, they have prevented enforcement of the no-harm rule against high-emitting states. Facing this complex evidential barrier, the international community has turned away from a liability-based approach to combatting climate change. However, this challenge should not be seen as absolutely preventing the no-harm rule's application to climate change-related matters. As the following section will discuss, the causation challenge is surmountable.

B Surmounting the challenge

The challenges in proving causation of harm are arguably not fatal to the application of the no-harm rule in the climate change context.¹¹⁸ As this section will explore, the extent to which the challenge of proving causation of harm can be overcome will depend on whether causation need be specific, or whether general causation or probabilistic attribution methods may suffice. While some scholars have questioned whether specific emissions will ever be able to be causally linked to specific harms,¹¹⁹ others contend that this may be possible both at a general and specific level.¹²⁰ This paper demonstrates that the causation requirement can be satisfied in climate change cases if a general approach is taken to meet a balance of probabilities standard. However, it also contends that specific causation may be possible as regards particular forms of harmful emissions. The value in taking a novel probabilistic approach to

¹¹⁷ Masson-Delmotte and others, above n 1.

¹¹⁸ Mara Tignino and Christian Bréthaut "The role of international case law in implementing the obligation not to cause significant harm" (2020) 20 Int Environ Agreements 631 at 646; Mayer, above n 34; Richard Tol and Roda Verheyen "State responsibility and compensation for climate change damages – a legal and economic assessment" (2004) 32 Energy Policy 1109 at 1112.

¹¹⁹ Oscar Schachter *International Law in Theory and Practice* (Brill, Leiden, 1991) at 380; and Wolfgang Dürner *Common Goods* (Nomos, Baden-Baden, 2001) at 54.

¹²⁰ David Grossman "Warming up to a Not So Radical Idea: Tort-Based Climate Change Litigation" (2003) 28 Colum J Envtl L 1; and Eduardo Penalver "Acts of God or Toxic Tort? Applying the Tort Principles to the Problem of Climate Change" (1998) 38 Nat Resour J563.

causation is also touched on, particularly for cases where geoengineering activities are involved.

1 Specific causation

The approach traditionally taken by international tribunals to establish causation adopts a “but for” test, asking whether the harm at issue would have occurred irrespectively of the alleged wrong.¹²¹ This test seeks to ascertain specific causation in-fact. A causal link between the activity and the harm is established if environmental harm would likely not have resulted had the defendant state not conducted the emitting activities in question.¹²² Such a specific link between emissions and environmental harm will invariably be hard to prove, considering that the contribution to climate change by states other than the defendant state may have still resulted a similar harm to that at issue in any given case.¹²³ However, in certain instances, the nature of emissions may make it possible to prove specific causation.

Certain forms of emissions, such as black carbon and tropospheric ozone, have been proven to be more short-lived than carbon dioxide emissions (yet they are equally, if not more, harmful).¹²⁴ Black carbon and tropospheric ozone remain in the atmosphere for only a number of days and primarily impact neighbouring territories. As a result, there is a more proximate and direct link observable between these types of emissions and their impacts.¹²⁵ Because of this proximity of harm, it may be possible to prove a specific causal link between the excessive release of these emissions and nearby environmental harm.¹²⁶ While this science only enables the attribution of liability for certain types of emissions, the impact that this would have on the climate would be immense. Emissions such as black carbon and tropospheric ozone contribute to ~40% of global warming and impact the climate at a much greater rate than carbon

¹²¹ Stallard, above n 47, at 183-184; *International responsibility: Sixth report by F V García Amador, Special Rapporteur* UN Doc A/CN.4/134 (26 January 1961) at 6; *Second report on state responsibility by Mr Gaetano Arangio-Ruiz, Special Rapporteur* A/CN.4/425 (9 June 1989) at 33; and Verheyen, above n 47, at 253.

¹²² Stallard, above n 47, 184.

¹²³ Phillip Barton “State Responsibility and Climate Change: Could Canada be Liable to Small Island States?” (2002) 11 Dalhous J Leg Stud 65 at 83; Stallard, above n 47, at 184; and Verheyen, above n 47, at 153.

¹²⁴ Climate and Clean Air Coalition “Black carbon” <ccacoalition.org>; Climate and Clean Air Coalition “Tropospheric ozone” <ccacoalition.org>; and Christoph Schwarte ‘No-harm rule’ and climate change (Legal Response Initiative, Briefing Paper, July 2012) at 4.

¹²⁵ Climate and Clean Air Coalition, above n 124; and Schwarte, above n 124, at 4.

¹²⁶ Schwarte, above n 124, at 4.

dioxide.¹²⁷ As such, although specific causation may not yet be possible where carbon emissions are at issue, holding states liable for other types of emissions where possible under the no-harm rule would significantly impact current rates of climate change.

2 *General causation*

A more widely applicable approach to this requirement of the no-harm rule would be general causation. At a general level, science is clear that there is a causal relationship between GHG emissions and climate change (in terms of average global temperature).¹²⁸ This relationship is both measurable and predictable. On this basis, the expected impact of an emitting activity on the climate can be estimated. Some scholars argue that this evidence is sufficient for assigning legal responsibility for transboundary climate change-related harm, at least for the most harmful emitting activities.¹²⁹ Proponents for this approach suggest that this high-level causal connection offers a means of attributing liability not to all emitting activities, but to those that emit the most severely. Large-scale emitting activities are the most measurable and, therefore, the most predictable (which in turn justifies the attribution of liability for them as the state conducting the activity should have been aware of the likely detrimental impacts of the activity).¹³⁰ Applied in practice, general causation would hold a state liable where it is probable that a causal link between that state's emitting activity and environmental harm exists, even if a specific link cannot be established.¹³¹ Because science is certain that excessive GHG emissions cause environmental harm,¹³² this could be considered sufficient logic to hold excessive emitters responsible for climate change-related harm under the no-harm rule.¹³³

Whether general causation suffices in court will depend on the standard of proof required. Should proof of causation beyond reasonable doubt be required, general causation would not

¹²⁷ Climate and Clean Air Coalition, above n 124; and Schwarte, above n 124, at 4.

¹²⁸ Tol and Verheyen, above n 118, at 1112.

¹²⁹ At 1112; and Mayer, above n 34, at 92.

¹³⁰ Mayer, above n 34, at 92; and Tol and Verheyen, above n 118, at 1112.

¹³¹ Grossman, above n 120, at 23.

¹³² Nathaniel L Bindoff and others "Detection and Attribution of Climate Change: from Global to Regional" in TF Stocker and others *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, Cambridge, 2013) at 869 and 871.

¹³³ Grossman, above n 120.

be enough.¹³⁴ However, past precedent favours a “balance of probabilities” approach.¹³⁵ This means that a causal link will be satisfactorily proven if there is a more than 50% chance that the wrongful act in question caused the harm at issue.¹³⁶ This standard is also consistent with the precautionary principle in international environmental law,¹³⁷ which seems to justify a lowering of the standard of proof.¹³⁸ Applying a balance of probabilities standard, general causation science may suffice to prove that it was more than likely that one state’s excessive emitting practices were at fault for climate change-related harm in a given case. Following this standard, science is arguably already advanced enough for the no-harm rule’s causation requirement to be met in climate change cases.¹³⁹

3 Probabilistic attribution

The other way that science is presently able to link climate change-related harms to anthropogenic activities is through probabilistic attribution.¹⁴⁰ Probabilistic attribution finds a causative link between a defendant’s action and the resulting harm where the defendant’s action materially increased the likelihood of that harm eventuating.¹⁴¹ It should be noted at the outset that probabilistic approaches to causation have not yet been used in international law.¹⁴² This being so, whether or not probabilistic attribution would suffice as a method for meeting

¹³⁴ Stallard, above n 47, at 185.

¹³⁵ *Corfu Channel*, above n 22, at [17] and [90]-[91].

¹³⁶ *Corfu Channel*, above n 22, at [17] and [90]-[91].

¹³⁷ The precautionary principle dictates that scientific uncertainty regarding the potential for an activity to cause harm should not excuse a failure to take preventative measures.

¹³⁸ *Southern Bluefin Tuna Cases (New Zealand v Japan; Australia v Japan) (Provisional Measures)* (1999) 38 ILM 1624.

¹³⁹ Barton, above n 123, at 83; and Stallard, above n 47, at 195.

¹⁴⁰ See Myles Allen “Liability for climate change” (2003) 421 *Nature* 891; David Frame and others “Climate change attribution and the economic costs of extreme weather events: a study on damages from extreme rainfall and drought” (2020) 162 *Clim Change* 781; David Frame and others “The economic costs of Hurricane Harvey attributable to climate change” (2020) 160 *Clim Change* 271; and Pardeep Pall, Michael Wehner and Dáithí Stone “Probabilistic extreme event attribution” in Jianping Li and others (eds) *Dynamics and predictability of large-scale, high-impact weather and climate events* (Cambridge University Press, Cambridge, 2016) 37.

¹⁴¹ Jon Williamson “Probabilistic Theories” in Helen Beebee, Christopher Hitchcock and Peter Menzies (eds) *The Oxford Handbook of Causation* (Oxford University Press, Oxford, 2009) 185 at 187; and Mark Parascandola “Causes, Risks and Probabilities: Probabilistic Concepts of Causation in Chronic Disease Epidemiology” (2011) 53 *Preventative Medicines* 232 at 233.

¹⁴² Verheyen, above n 47, at 327.

the causation requirement of the no-harm rule would depend on whether international courts considered it appropriate.¹⁴³ Nonetheless, some scholars suggest that this approach should be adopted on the basis that it is the most practical approach for assigning responsibility for climate change.¹⁴⁴

In the climate change context, probabilistic attribution has thus far primarily been used to prove a causal link between climate change and extreme weather events.¹⁴⁵ While extreme weather events are a known consequence of climate change and a possible consequence of future geoengineering deployment, attributing liability for these events is exceptionally challenging (considering that these could have naturally occurred irrespective of climate change). Probabilistic attribution is thus of the most use for this category of harm as extreme weather events cannot be causally attributed to anthropogenic activities using other specific or general standards of causation.

Frame and others have developed a methodology based on probabilistic event attribution to quantify damages associated with climate change by modelling the likelihood of extreme weather events (specifically, floods and droughts) occurring without climate change, and comparing these findings with models of the likelihood of those events occurring with climate change.¹⁴⁶ From this, they are able to estimate the fraction of the risk of any one extreme weather event that is attributable to climate change.¹⁴⁷ At this stage, this science only goes so far as to predict the likelihood that an extreme weather event was caused by climate change. It does not offer a mechanism for predicting the contribution of any one state's emissions to the resulting harm. However, where this model may be useful is in determining a causal link between geoengineering activities (particularly, the use of SRM technologies) and extreme changes in weather patterns. For example, recalling that a possible consequence of the use of SAI technology is changed rainfall and monsoon patterns in Asia and Africa,¹⁴⁸ should this SAI be deployed, probabilistic attribution could compare the rainfall and monsoon patterns

¹⁴³ This is something that an ICJ advisory opinion could clarify.

¹⁴⁴ Grossman, above n 120; Allen, above n 140; and Simlinger and Mayer, above n 63.

¹⁴⁵ See Frame and others, above n 140; and Pall, Wehner and Stone, above n 140.

¹⁴⁶ Frame and others, above n 140, at 783.

¹⁴⁷ Frame and others, above n 140, at 788.

¹⁴⁸ Robock and others, above n 97, at 1; Robock, above n 97, at 174-176; and The Royal Society, above n 97, at 31.

following SAI deployment with models of the expected weather patterns absent any geoengineering influence to determine the risk that any weather changes that eventuated were materially contributed to by the use of SAI. Considering the precarious state of the climate, any finding of material contribution to climate change-related harm should arguably justify the attachment of responsibility to a state for deploying geoengineering technologies or emitting excessively without taking appropriate preventative measures. In determining the likelihood of any such contribution, probabilistic attribution offers a mechanism for holding states liable for climate change-related harm where traditional causation in-fact could not be established.

4 *Summarising causation*

Ultimately, improvements in general attribution science are demonstrating that the causation requirement is becoming a more surmountable evidential barrier in proving a breach of the no-harm rule in the climate change context. While specific causation may still be too challenging to prove in most cases, general causation science is arguably strong enough to meet a balance of probabilities standard of proof in cases brought against the highest contributors to climate change. Probabilistic attribution should not be overlooked as an alternative mechanism for finding a causal link between anthropogenic activities and climate change (particularly for geoengineering cases), though whether or not a court will accept such an approach remains to be seen. Overall, developing science suggests that the causation requirement is *not* an insurmountable evidential barrier preventing the application of the no-harm rule in climate change cases.

VI *Challenge in application 2: Remedial obligations*

Another notable challenge when applying the no-harm rule to climate change-related cases is that of determining what remedial obligations should be imposed on liable states. In international environmental law, where a breach of the no-harm rule is established, the usual international rules of state responsibility apply.¹⁴⁹ Under these rules set out in the ILC's Draft Articles on Responsibility of States for Internationally Wrongful Acts (Draft Articles on State Responsibility), a liable state is required to cease the activity causing harm and make full reparation for the harm caused.¹⁵⁰ However, in cases involving climate-related harm,

¹⁴⁹ International Law Commission, above n 45.

¹⁵⁰ At arts 30 and 31.

difficulties can arise in requiring emitting states to comply with both obligations. This part will breakdown the challenges faced both in requiring the cessation of emitting activities and in determining appropriate reparation for climate-related harms. It will discuss how such challenges can be overcome to enable the no-harm rule to be enforced in climate change cases.

A Cessation

Where a state is responsible for an internationally wrongful act, article 30 of the Draft Articles on State Responsibility requires that the responsible state cease the wrongful act.¹⁵¹ While it may sound logical and fair to expect immediate cessation of a wrongful act, in the climate change context, expecting immediate cessation of an emitting activity may be unrealistic. Both financially and operationally, the successful functioning of society today is heavily dependent on the combustion of fossil fuels.¹⁵² To require the immediate cessation of such activities would therefore be impractical.¹⁵³

Some argue that cessation is an absolute obligation under the laws of state responsibility.¹⁵⁴ This argument is based on the lack of guidance provided by the Draft Articles on State Responsibility regarding cessation orders, which has been interpreted to mean that the cessation obligation is an absolute one, lacking any flexibility.¹⁵⁵ Such an interpretation renders this law of state responsibility unworkable where climate change-related matters are at issue as GHG emissions cannot easily be reduced, let alone ceased, in a short period of time.¹⁵⁶

However, more usefully for climate change-related issues, a consistent body of practice evidences that less-than-full reparation may be satisfactory in circumstances where full reparation would be unrealistic or would not serve the interests of international justice.¹⁵⁷ The

¹⁵¹ Article 30.

¹⁵² Mayer, above n 34, at 95.

¹⁵³ At 95; and Hanquin Xue *Transboundary Damage in International Law* (Cambridge University Press, Cambridge, 2002) at 147.

¹⁵⁴ Christina Voigt “State Responsibility for Climate Change Damages” (2008) 77 *Nord J Int Law* 1 at 19.

¹⁵⁵ At 19; Verheyen, above n 47, at 242.

¹⁵⁶ Voigt, above n 154, at 19.

¹⁵⁷ *Summary record of the 2392nd meeting of the International Law Commission* UN Doc A/CN.4/SR.2392 (1995) at 31; *Summary record of the 2454th meeting of the International Law Commission* UN Doc A/CN.4/SR.2454 (1996) at 19; and *Trail Smelter case*, above n 20, at 1939.

infeasibility of absolute cessation in certain cases has been recognised.¹⁵⁸ Instead of interpreting the duty of cessation to be an absolute obligation, jurisdictional applications of the no-harm rule have preferred to balance the conflicting interests at play in cases where absolute cessation is impossible.¹⁵⁹ For example, in the *Trail Smelter* case, the arbitral tribunal prescribed as a remedy a detailed regime for control of the activity causing harm, as opposed to an order for absolute cessation.¹⁶⁰ Following this logic, a more appropriate remedial obligation to be placed on states liable for causing climate change-related transboundary harm would be to reign in the harmful activity to an acceptable level following a detailed regime similarly specified by the court.

Even more satisfactorily, the regime may take a step further to specify how the harmful activity should be phased out in the long-term.¹⁶¹ The result would be a committed phase-out. A liable state would commit to ultimately ceasing the harmful activity at issue, but do so gradually, in accordance with a scientifically backed plan that ensures the phase-out is done as quickly as reasonably possible. In this way, though the practicalities of the given case may prevent immediate cessation, in the long-term, the cessation obligation could still be met absolutely. This would be particularly appropriate where harm was caused by the deployment of geoengineering technologies. Though, in such a case, the use of such technology could arguably be immediately halted, depending on how long the technology had been operating, immediate cessation might not be desirable for the risk that ecosystems would struggle to adapt to the sudden change in atmospheric conditions that immediate cessation might cause.¹⁶² A plan to safely phase out use of the technology causing harm would be a more favourable solution.

By following this phase-out approach rather than demanding impractical immediate cessation, this remedial obligation under the laws of state responsibility can still be satisfied in climate change-related cases. Not only is this a more realistic approach, but it would be absurd if the

¹⁵⁸ Xue, above n 153, at 147; Mayer, above n 34, at 95-96.

¹⁵⁹ *Summary record of the 2392nd meeting of the International Law Commission*, above n 157, at 31; *Summary record of the 2454th meeting of the International Law Commission*, above n 157, at 19; and *Trail Smelter case*, above n 20, at 1939.

¹⁶⁰ *Trail Smelter case*, above n 20, at 1966-1978.

¹⁶¹ Mayer, above n 34, at 96.

¹⁶² Ross and Damon Matthews, above n 87, at 4.

laws of state responsibility could not accommodate for climate change-related cases because of the “unworkability” of the cessation requirement, when cessation of harmful emitting activities is precisely the end goal that we need to combat climate change. For this requirement not to be flexible enough to account for cases where serious environmental harm is being caused but where absolute cessation is impractical would defeat the purpose of the obligation in the first place in cases where it is arguably most needed.

B Reparation

The second obligation imposed on states liable for an internationally wrongful act is to make full reparation for the harm caused.¹⁶³ Article 34 of the Draft Articles on State Responsibility specifies that reparation “shall take the form of restitution, compensation and satisfaction, either singularly or in combination”, as set out in Chapter II of the Draft Articles.¹⁶⁴ What forms of reparation are appropriate will vary depending on the practicalities of the case at hand. As will be discussed, the complexities of climate change-related harms make the determination of appropriate reparation for such harms challenging. However, as demonstrated, reparation in the form of either compensation and/or satisfaction is possible in the climate change context, with the latter offering a particularly practical solution for acknowledging state responsibility for harm and influencing improved future actions.

1 Restitution

First, restitution requires the wrongdoer to restore the situation *ex ante* (i.e., to the situation that existed prior to the wrongdoing).¹⁶⁵ Exceptions to this requirement arise where it is “not materially possible” to restore the situation *ex ante*, or where to do so would involve a burden to the wrongdoer “out of all proportion to the benefit deriving from restitution instead of compensation”.¹⁶⁶ In climate change cases, the former exception will often apply; it will invariably be impossible to restore the situation *ex ante*.¹⁶⁷ Once caused, many environmental harms are irreversible. Thus, while steps may exist to improve the harmed environment, restoring the environment to its pre-harmed state will not be an option. This being so, where a

¹⁶³ International Law Commission, above n 45, at art 31.

¹⁶⁴ Article 34.

¹⁶⁵ Article 35.

¹⁶⁶ Article 35(a) and (b).

¹⁶⁷ Voigt, above n 154, at 18.

breach of the no-harm rule is established in climate change cases, compensation and satisfaction will likely be more appropriate remedies.

2 Compensation

Per article 36 of the Draft Articles on State Responsibility, a state found to have breached the no-harm rule must compensate the victim state for the harm caused, covering any financially assessable damage.¹⁶⁸ However, for cases involving climate change-related harm, financial reparation is challenging to determine. Firstly, environmental harm is of itself challenging to quantify financially.¹⁶⁹ This is because environmental harm is reflected not only in actual damage to the environment itself, but also in the flow on impacts that such harm can have for the economy and/or security of the state in which the damage occurred.¹⁷⁰ For example, if compensation was being calculated for damage to farmlands, the compensation award should account for not only the change in land value of the farmland, but also for the economic opportunities lost from that land and the flow on effects that damage to the farmland may have on food security within a state. Additionally, compensation should ideally recognise the impact that environmental damage may have on people's culture, health, and livelihoods, though such things cannot be easily financially valued.¹⁷¹ While damages calculations such as these may be complex, such complexity has not prevented the courts from being able to award financial compensation for breaches of the no-harm rule thus far. In fact, damages have been awarded for breach of the no-harm rule since it was first applied in the *Trail Smelter case*.¹⁷² The ICJ has affirmed that loss of "ecosystem services"¹⁷³ as a result of a breach of the no-harm rule are compensable.¹⁷⁴ To measure this, the Court quantifies the difference in value of services

¹⁶⁸ International Law Commission, above n 45, at art 36.

¹⁶⁹ Verheyen, above n 47, at 245.

¹⁷⁰ At 245.

¹⁷¹ Serdeczny "Non-economic Loss and Damage and the Warsaw International Mechanism" in R Mechler and others (eds) *Loss and Damage from Climate Change: Climate Risk Management, Policy and Governance* (Springer, Cham, 2019); and Simlinger & Mayer, above n 63, at 191.

¹⁷² However, it should be noted that the damages award in this case was arguably insubstantial. *Trail Smelter case*, above n 20.

¹⁷³ "Ecosystem services" are the benefits that humans derive from ecosystem processes that make life possible. See Cotzana and others "The Value of the World's Ecosystem Services and Natural Capital" (1997) 387 *Nature* 253 at 255.

¹⁷⁴ *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v Nicaragua)* [2018] ICJ Rep at [42].

provided by the impacted ecosystem prior to and following the wrongful act at issue.¹⁷⁵ Also taken into account is that environmental damage may continue for years into the future, though will likely diminish over time.¹⁷⁶ That international tribunals have been able to navigate these complexities in previous environmental cases indicates that damages in climate change cases should be able to be similarly awarded.

However, what makes the quantification of compensation for climate change damages particularly challenging is that, as climate change is contributed to all states (including, to some degree, the victim state), the extent of the responsible state's liability must be quantified proportionately to that state's actual contribution to the harm at issue.¹⁷⁷ Adding to this, in climate change cases, the capacity of the liable state to have taken a more climate-friendly course of action must be taken into consideration (to comply with the principle of common but differentiated responsibilities).¹⁷⁸ Thus, calculating compensation is not as straight forward as simply quantifying the harm suffered as a result of the liable state's conduct, but rather requires consideration of the extent to which the liable state should account for the total impact of harm to the victim state based on external factors, such as state capacity.

Noting the complexities involved in calculating compensation for climate change-related harm, Mayer has argued that financial compensation is not a critical remedy.¹⁸⁰ Instead, he suggests that forms of satisfaction (explored in the following section), such as a declaration of liability and an acceptance of responsibility by the liable state, would be sufficiently influential remedies, as these would result in the liable state attracting political pressure to improve their practices.¹⁸¹ While this may be so, the importance of financial redress should not be

¹⁷⁵ At [78].

¹⁷⁶ At [82].

¹⁷⁷ Voigt, above n 154, at 19; and Jervan, above n 11, at 114.

¹⁷⁸ Common but differentiated responsibilities is a principle of international environmental law that holds that protecting the environment is an obligation shared by all states, though states have differing degrees of responsibility for environmental protection based on factors such as their contribution to climate change and their level of development. See United Nations Framework Convention on Climate Change, above n 4, art 3(1).

¹⁷⁹ *Eritrea-Ethiopia Claims Commission, Final Award* (17 August 2009) XXVI UNRIAA 631 at 22 and 24; Mayer, above n 34, at 101-102.

¹⁸⁰ Mayer, above n 34, at 81 and 96.

¹⁸¹ At 81 and 96.

overlooked. Particularly for victim states that may be especially vulnerable to climate change and struggling to finance necessary climate adaptation measures, financial compensation offers a critical mechanism to help that state recover from harm already suffered. This being so, quantifying compensation for climate change-related harm should not be shied away from just because it is a complex task.

While detailed analysis of damages calculations exceeds the scope of this paper, it is suggested that quantifying compensation for climate change-related harm is very doable. Indeed, science has developed such that compensation for climate change-related harm is arguably calculable.¹⁸² As a starting point, the link between GHG emissions and climate change is measurable and predictable. Additionally, environmental damage is arguably just as compensable as property damage (which is financially compensated for all the time).¹⁸³ This being so, similar measures for valuing the loss suffered by the victim state, such as the fair market value of the property/environmental asset and any lost financial opportunities, can be applied.¹⁸⁴ As for considerations of contribution, including possible contribution by the victim state, the ILC has clarified that a compensation award will only be reduced where any such contribution was negligent.¹⁸⁵ The mere fact that other states contribute to climate change will not suffice; rather, only careless, preventable contributions to the climate change-related harm at issue may impact the compensation owed by a liable state.¹⁸⁶ Admittedly, however, determining the threshold at which other contributions to climate change can be classified as wrongful requires further complex analysis.¹⁸⁷ Finally, factors such as state capacity could be

¹⁸² See for example Frame and others, above n 140; and Nyka, above n 48, at 131.

¹⁸³ Mahir Al Banna “State Responsibility in Combatting Dangerous Climate Change: The Critical Role of Domestic and International Justice” in M Mateev and P Poutziouris (eds) *Creative Business and Social Innovations for a Sustainable Future* (Springer Nature, Switzerland, 2019) 263 at 266; International Law Association *Report of the 64th conference* (Rapp Rauschning, 1990) at 302; and *Report of the International Law Commission on the Work of its Fifty-third Session* UN Doc A/56/10 (2001) at 252.

¹⁸⁴ Verheyen, above n 47, at 246.

¹⁸⁵ At 248; *Report of the International Law Commission on the Work of its Fifty-third Session*, above n 183, at 275; and Stallard, above n 47, at 193.

¹⁸⁶ *Report of the International Law Commission on the Work of its Fifty-third Session*, above n 183, at 275; Verheyen, above n 47, at 248.

¹⁸⁷ Simlinger and Mayer, above n 63, at 191; and Tarcísio Hardman Reis *Compensation for Environmental Damages Under International Law: The Role of the International Judge* (Kluwer Law International B.V., Alphen aan den Rijn, 2011) at 183.

taken into account as necessary at the court or tribunal's discretion based on the circumstances of the case. None of these remedial principles are foreign to the law. Hence, while it may be a complex task, it appears possible to quantify damages for breach of the no-harm rule in climate change cases.

Most realistically, a complicated damages calculation would not be considered necessary in cases involving large scale climate change-related harm. While the remedial obligation set out in the Draft Articles on State Responsibility requires a liable state to make "full reparation" for harm caused, precedent suggests that in cases involving large injuries,¹⁸⁸ an agreement on less-than-full compensation has sufficed.¹⁸⁹ Relevant factors that have been considered in such cases include the injured party's need for financial compensation, the liable state's capacity to pay, and the extent of the liable state's culpability for the damage.¹⁹⁰ In cases of transboundary harm, the compensation award should reflect a fair balance between the interests of the injured state and the liable state.¹⁹¹ The ICJ has importantly stated in numerous environmental cases that the challenges involved in quantifying compensation should not prevent an award of damages to a wronged state.¹⁹² The Court has the power in such situations to make equitable estimates to ensure that a fair outcome is reached.¹⁹³ Such a statement from the ICJ itself affirms that remedial challenges must not be used in argument against the utility of the no-harm rule in the climate change context. Where a wrong is found to be done, economic complexities should not be used to prevent a wronged state from seeking justice.

¹⁸⁸ It should be noted that in most environmental cases that have been heard by international courts and tribunals, the environmental damage at issue has been on a relatively small scale as compared with the possible harms of that may arise in climate change cases. See Nyka, above n 48, at 147.

¹⁸⁹ *Responsabilité de l'Allemagne à raison des dommages causés dans les colonies portugaises du sud de l'Afrique (Portugal v Germany)* [1928] UNRIIAA Vol II 1101.

¹⁹⁰ *Eritrea-Ethiopia Claims Commission*, above n 179, at [22]; Benoît Mayer "Less-than-full reparations in international law" (2016) 56 *Indian J Int Law* 463; Mayer, above n 50.

¹⁹¹ *Yearbook of the International Law Commission 2006, Vol. II, Part Two* (2006) UN Doc A/CN.4/SER.A/2005/Add.1 (Part 2) at 58ff.

¹⁹² *Ahmadou Sadio Diallo (Guinea v Democratic Republic of the Congo) (Judgement) (Preliminary Objections)* [2007] ICGJ 52; *Certain Activities Carried Out by Nicaragua in the Border Area*, above n 174, at [86]; and *Trail Smelter case*, above n 20.

¹⁹³ *Ahmadou Sadio Diallo*, above n 192; *Certain Activities Carried Out by Nicaragua in the Border Area*, above n 174, at [86]; Stallard, above n 47, at 195; and *Trail Smelter case*, above n 20.

3 *Satisfaction*

Finally, where restitution or compensation cannot satisfactorily remedy injury caused by a breach of the no-harm rule, the responsible state must give “satisfaction”.¹⁹⁴ This involves measures such as an acknowledgement of the breach of the international obligation, a formal apology, or other expressions of regret, such as policy efforts to prevent future wrongdoing.¹⁹⁵ While this may do little for relieving the impacts of harm suffered by a victim state, in the climate change context, these measures cannot be underestimated for their critical role in promoting preventative climate action. An acknowledgement of responsibility and an apology for environmental damage shines a light on the wrongdoer’s practices. Crucially, in the aftermath of an apology, pressure can be put on the responsible state to ensure that future practices reinforce their apology by evidencing a greater focus on environmental protection and sustainability.¹⁹⁶ It is this focus on preventing further harm that makes satisfaction a particularly appropriate for breach of the no-harm rule in climate change cases as, while the needs of those already harmed by climate change must not be ignored, a focus on prevention will have a greater impact on the scale of suffering resulting from climate change globally.¹⁹⁷ Mayer suggests that satisfaction in this context should involve complementary symbolic and material measures.¹⁹⁸ For example, a formal apology could be accompanied by an investment in climate change adaptation measures in the victim state. This demonstrates that the apology was more than mere lip service, while also providing the victim state with some material relief, appreciating that their injury cannot be apologised away.

Overall, what is clear is that numerous options exist for remedying climate change-related harm suffered as a result of a breach of the no-harm rule. While remedial obligations in their traditional sense (immediate cessation and absolute compensation) might be unrealistic to demand from a liable state, remedial obligations are still able to be applied. Whether it be a “committed phase-out” of the damaging activity, an equitable damages award, or a combination of symbolic and material measures of satisfaction, a wronged state can be

¹⁹⁴ International Law Commission, above n 45, art 37(1).

¹⁹⁵ Article 37(2).

¹⁹⁶ Mayer, above n 190, at 213-214.

¹⁹⁷ At 213.

¹⁹⁸ At 213-214.

remedied in some way for harm suffered, while the imposition of such remedial obligations on liable states should concurrently serve to deter future breaches of the no-harm rule.

VII Challenge in application 3: Enforcement

A final challenge inhibiting the application of the no-harm rule in climate change cases is the consensus-based model of international litigation. As a state party accused of climate change-related harms is unlikely to provide the required consent to proceedings, there is little that international courts can do to enforce breaches of the no-harm rule. Yet, this challenge is not new, presenting a recurring barrier to the litigious enforcement of international law generally.¹⁹⁹ This part argues that, despite the fact that international climate change litigation is unlikely, the normative influence of law and the political implications that can result from a breach of customary international law mean that the no-harm rule remains a useful tool for combatting climate change.

A The challenge

To enforce the laws of state responsibility where a breach of the no-harm rule is alleged, a victim state must bring a claim before an international court. As no specific court for environmental matters exists, such claims will ordinarily be brought before the ICJ.²⁰⁰ Yet, for a case to be heard by the ICJ, all parties must consent to the proceedings.²⁰¹ The implication of this requirement is that it invariably prevents the hearing of cases in which one party (the alleged wrongdoer) has plenty to lose and nothing to gain, as that party will likely withhold consent to the case proceeding. The result is that most ICJ cases to date involving alleged breaches of the no-harm rule have involved situations where both parties have something to gain (and believe that they can win the case),²⁰² or where parties had previously accepted the Court's jurisdiction on the relevant issue.²⁰³ Alternative mechanisms for resolving disputes

¹⁹⁹ Oona A Hathaway "Between Power and Principle: An Integrated Theory of International Law" (2005) 72 U Chi L Rev 469 at 491.

²⁰⁰ Statute of the International Court of Justice, art 36.

²⁰¹ Article 36.

²⁰² For example *Certain Activities Carried Out by Nicaragua in the Border Area*, above n 174; *Gabčíkovo-Nagymaros Project*, above n 32; and *Case Concerning Pulp Mills on the River Uruguay*, above n 7.

²⁰³ For example *Corfu Channel*, above n 22.

regarding a breach of the no-harm rule include arbitration,²⁰⁴ or diplomatic alternatives such as mediation or negotiation. However, again, these forms of dispute resolution all depend on state consent to proceed.

Where a claim involves an alleged breach of the no-harm rule for climate change-related harm, obtaining the consent of the allegedly responsible state to adjudication will be particularly challenging. This is so for many reasons. Firstly, because climate change is a problem contributed to by all, states have been very reluctant to assume individual responsibility for the harms that their emissions cause. The preferred approach, as evidenced by the UNFCCC and related instruments, is collective responsibility; any climate-related harm is considered the responsibility of the international community as a whole.²⁰⁵ A judicial finding of individual state responsibility would run contrary to this approach.²⁰⁶ Secondly, the applicability of the no-harm rule to climate change cases is still disputed by some who argue that climate change-related matters are governed solely by the UNFCCC framework.²⁰⁷ To consent to litigation would be to consent to possible judicial confirmation of the no-harm rule's applicability to climate change. As such, by consenting to litigation, states would risk subjecting themselves to a legal obligation that they might not presently consider themselves bound by. Finally, in climate change litigation, there is a high likelihood that the defendant state has plenty to lose and nothing to gain. If they win the case, they can continue with their emitting activities, as they already do. If they lose, they must make good their wrong following the laws of state responsibility and amend their emitting practices so not to be alleged of causing further harm. With a cost-benefit ratio such as this, obtaining state consent to adjudication is highly unlikely.

²⁰⁴ For example *Trail Smelter case*, above n 20.

²⁰⁵ Paris Agreement, above n 4, art 2; and United Nations Framework Convention on Climate Change, above n 4, preamble.

²⁰⁶ It should be noted that article 14 of the UNFCCC offers states the opportunity to declare that disputes arising under the Convention shall be directed to either the ICJ or to arbitration. If such declarations were made, it might suggest that findings of individual responsibility for climate change-related matters may be consistent with the UNFCCC. However, thus far only three states have made any such declaration (The Netherlands has accepted the ICJ's jurisdiction, while the Solomon Islands and Tuvalu have recognised compulsory arbitration). United Nations Climate Change, above n 69.

²⁰⁷ Zahar, above n 51.

B *Surmounting the challenge*

While it may be highly unlikely that climate change cases involving alleged breaches of the no-harm rule will be able to be heard by international courts, the rule arguably still has the potential to influence states' emitting behaviours. This is because of the normative and political influence of international law.²⁰⁸ While international law may not always be able to be enforced judicially, it has an immense influence over global politics.²⁰⁹ International law exists because states share certain moral understandings that influence how they believe they should behave and interact with one another.²¹⁰ Thus, where international law is thought to have been breached, states will react to this through diplomatic means (for example, by imposing sanctions).²¹¹

At the time of writing, this is being evidenced most clearly by the Russo-Ukrainian war. Russia has violated one of the most fundamental principles of international law, the prohibition on the use of force against another state,²¹² along with numerous other international crimes of aggression.²¹³ While Russia will not consent to judicial proceedings on this matter, the law has still been influential in the political response to the war. The international community has responded to Russia's invasion of Ukraine with widespread outrage. Most states imposed sanctions on Russia and its oligarchs,²¹⁴ and the United Nations General Assembly voted to

²⁰⁸ Mayer, above n 34, at 89.

²⁰⁹ At 89.

²¹⁰ Jutta Brunnée and Stephen J Troope *Legitimacy and Legality in International Law: An Interactional Account* (Cambridge University Press, Cambridge, 2010) at 88 and 97.

²¹¹ Mayer, above n 34, at 89.

²¹² Charter of the United Nations, art 2(4).

²¹³ David J Scheffer "Can Russia Be Held Accountable for War Crimes in Ukraine?" (4 April 2022) Council on Foreign Relations <cfr.org>; Jennifer Tahrán "A Reminder of the Importance of the Crime of Aggression: Considering the Situation of Russia and Ukraine" (2 April 2022) OpinioJuris <opiniojuris.org>; and Juliette McIntyre, Douglas Guilfoyle and Tamsin Phillipa Paige "Is international law powerless against Russian aggression in Ukraine? No, but it's complicated" (26 February 2022) The Conversation <theconversation.com>.

²¹⁴ See for example Alex Stambaugh, Julia Horowitz and Michelle Toh "G7 countries agree to cap the price of Russian oil" (2 September 2022) CNN Business <edition.cnn.org>; Alex Therrien "Ukraine Conflict: UK sanctions target Russian banks and oligarchs" (24 February 2022) BBC News <bbc.com>; Special Economic Measures (Ukraine) Regulations SOR/2022-166; and The White House "Remarks by President Biden Announcing Actions in Ukraine" (22 February 2022) <whitehouse.gov>.

condemn Russia for its invasion.²¹⁵ As such, even though top-down enforcement of the law was not available, bottom-up demands for legal compliance from states demonstrated that the law can be enforced in other ways.

Any such diplomatic response to a breach of the no-harm rule will admittedly not be so straight forward. While a breach of the most fundamental principles of international law will attract widespread international condemnation, such a response to a breach of the no-harm rule in climate change cases is improbable, considering the unwillingness of powerful states to acknowledge the rule in this context. Yet, this attitude could shift (and arguably is shifting). Members of the international community have shown a renewed interest in holding states individually accountable for their contribution to climate change. This has most recently been exemplified by the revived initiative to seek an ICJ advisory opinion on state responsibility for climate change-related harms.²¹⁶ The support that the initiative has received from numerous states and from civil society suggests that attitudes are shifting internationally in favour of state responsibility for climate change.²¹⁷ That an ICJ advisory opinion on this subject matter has even been brought evidences that states are cognisant that there are international environmental laws that are likely being breached by states' current emitting activities. As such, it is possible that we might see the no-harm rule and other international environmental obligations being raised by states in their diplomatic interactions with one another, increasing the influence of these laws politically.

International acknowledgement of the legal responsibilities of individual states to prevent climate change-related harms from occurring is evidently growing. As this continues to happen, it becomes more likely that breaches of the no-harm rule in climate change cases will be more politically costly for the breaching state, being met with frustration both from other members of the international community and also from civil society more generally. The latter group must not be overlooked for their influence. Particularly in democratic states, often the most political influence is held by members of society themselves. With governments dependent on public vote, the will of the people will significantly influence government policy decisions.²¹⁸

²¹⁵ *Aggression against Ukraine* UN Doc A/ES-11/L.1 (1 March 2022).

²¹⁶ Gunia, above n 57; and Vanuatu ICJ Initiative, above n 52.

²¹⁷ Climate Home News, above n 57; and Jackson, above n 58.

²¹⁸ Mayer, above n 34, at 89.

Climate activism and public concern about climate change is on the rise.²¹⁹ Thus, as the voting public becomes more aware of their government's international climate change obligations, governments will likely be encouraged to comply with these obligations to stay in power. This being so, growing public awareness about the no-harm rule could arguably be the solution for ensuring greater state compliance with it. It is highly likely that in today's age of instant online information sharing, a state population could be quickly alerted to the harms that their government's activities might be causing and respond accordingly, demanding that the responsible state remedy the situation appropriately. Similarly, if the general public were alerted to the possibility of geoengineering deployment and its associated risks, it is highly likely that they would demand that greater precautionary measures be taken prior to any such deployment. Should the use of geoengineering technology go wrong and it be revealed that adequate preventative measures had not been taken, the political consequences for the responsible state would likely be severe.

Thus, while the chance of the no-harm rule being judicially enforced in climate change cases might be low, the rule holds the normative potential to influence state behaviour politically. Whether it be pressure from other states or pressure from citizens within states, political incentives for compliance with the no-harm rule have the potential to grow. As such, the no-harm rule should not be overlooked in the climate change context. With greater education about the rule and the obligations it entails, it could be not our courts, but our governments and our people, that enable the rule to play a central role in combatting dangerous anthropogenic climate change.

VIII Conclusion

Climate change is presenting an existential threat to life on Earth as we know it.²²⁰ Yet, this threat has not been enough of itself to motivate states to take the necessary measures to prevent further harm to our planet. The time is ripe for states to be held individually accountable for their failures to prevent anthropogenic climate change. The no-harm rule offers a legal basis

²¹⁹ Amnesty International "Climate change ranks highest as vital issue of our time – Generation Z survey" (10 December 2021) <amnesty.org>; and Elena Ares and Paul Bolton "The rise of climate change activism?" (24 June 2020) UK Parliament <commonslibrary.parliament.uk>.

²²⁰ Masson-Delmotte and others, above n 1.

for this. By attributing liability to those who cause harm when they had the means to prevent it, the no-harm rule arguably takes a fair approach to attributing individual responsibility for harms that may have, to some extent, been collectively contributed to.

That the no-harm rule has not yet been used in climate change cases has been blamed on its unworkability in the climate change context. While challenges related to the causation requirement, remedial obligations, and enforcement of the rule evidently exist, this paper has shown these to be surmountable. Instead, it is more likely that the virtual absence of the no-harm rule from the international climate change regime thus far can be credited to the unwillingness of powerful states to acknowledge it, fearful of its implications for their emitting practices.

Whether it be to stop the release of excessive global GHG emissions, or to place some limitations on the use of presently unregulated geoengineering technologies, the no-harm rule has a clear role to fill in the international climate change regime. Concurrently, political appetite for states to be held individually responsible for the environmental harms that they cause is arguably growing. Already an established customary legal norm, the no-harm thus has the potential to demand that states take their individual contributions to climate change more seriously, and take greater care to reduce their environmental footprint. Greater education and awareness about the rule is arguably needed for this potential to be realised. With time running out to prevent dangerous anthropogenic climate change, the no-harm rule must be overlooked no longer.

Word Count

The text of this paper (excluding abstract, table of contents, non-substantive footnotes, and bibliography) is 11,277 words.

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