E.ISSN: 2661-7404 Academic Journal of Legal and Political Researchs P.ISSN:2571-9971
Year: 2026 Vol : 10 No : 02 Page : 1393 - 1409

Transboundary Environmental Harm: The Gap between Prevention and Reparation

Khalfallah faouzi *
Doctor of Public International Law,
Faculty of law and political science,
University of Khenchela, Algeria
fkhalfallah6@gmail.com

Received: 19- 08- 2026 **Accepted: 09- 09- 2026** **Published: 22- 09- 2026**

Abstract:

This article examines international responsibility for transboundary environmental harm, proceeding from the observation that the two components of that responsibility have not developed at the same pace. The obligation of prevention has been consolidated in a continuous line of jurisprudence running from the Trail Smelter arbitration to the advisory opinions of 2024 and 2025, and its content has been elaborated into determinate procedural requirements. The mechanisms of reparation, by contrast, have remained undeveloped: the International Law Commission divided the subject in 1997 and completed the prevention component as draft articles recommended for conversion into a convention, while completing the liability component only as non-binding draft principles; the general conventions on civil liability for environmental damage have not entered into force; and the International Court of Justice has awarded compensation for environmental damage on a single occasion, in a sum of less than four hundred thousand United States dollars. Through an analysis of this dissociation and of its causes, the study concludes that the difficulty resides not in the absence of a primary obligation but in three technical obstacles concerning the definition of damage, the establishment of causation and the valuation of loss, and that the contemporary practice in the fields of climate change and plastic pollution reproduces the same pattern.

Keywords: Transboundary harm, obligation of prevention, reparation, environmental damage, State responsibility, due diligence.

Introduction:

International responsibility is composed of two elements which are logically inseparable. The first is the primary obligation whose breach engages responsibility; the second is the secondary obligation of reparation which follows upon that breach. An obligation without a consequence attaching to its breach is a precept rather than a rule of law, and the Permanent Court of

* **Corresponding author**

International Justice expressed this in the proposition that reparation is the indispensable complement of a failure to apply a convention[1].

In the field of the environment these two elements have not developed at the same pace, and the disparity is not a matter of degree. The obligation not to cause significant transboundary environmental harm is among the most firmly established rules of contemporary international law: it has been affirmed in a continuous line of decisions extending over some eighty-five years, its content has been elaborated into determinate procedural requirements, and it was extended in 2025 to the climate system itself. The mechanisms by which reparation for such harm is to be secured, by contrast, have remained in a state of arrested development which cannot be attributed to inadvertence.

Three indicators establish the disparity. The first is institutional: the International Law Commission, having taken up the subject in 1978, divided it in 1997 into a prevention component and a liability component; it completed the former in 2001 as draft articles which it recommended the General Assembly convert into a convention, and completed the latter in 2006 only as draft principles which the Assembly merely commended to the attention of governments[2], The second is conventional: the general instruments on civil liability for environmental damage have not entered into force, and effective regimes exist only in narrowly defined sectors, The third is judicial: the International Court of Justice has affirmed the obligation of prevention repeatedly, but has awarded compensation for environmental damage upon a single occasion, in 2018, in a sum below four hundred thousand United States dollars.

The central research question may accordingly be formulated as follows: what accounts for the dissociation between the consolidation of the obligation of prevention and the failure of the mechanisms of reparation in respect of transboundary environmental harm, and what are the consequences of that dissociation for the effectiveness of international environmental law? Four subsidiary questions stem from it:

What is the content of the obligation of prevention as elaborated by the jurisprudence, and upon what does its consolidation rest?

What is the significance of the division effected by the International Law Commission in 1997, and why did the liability component fail?

What are the technical obstacles which have prevented the development of a general regime of reparation for environmental damage?

Does the contemporary practice in the fields of climate change and plastic pollution disclose a departure from this pattern or its reproduction?

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[2] International Law Commission, Articles on Prevention of Transboundary Harm from Hazardous Activities, 2001; and Principles on the Allocation of Loss in the Case of Transboundary Harm Arising out of Hazardous Activities, 2006.

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The study proceeds from the hypothesis that the dissociation is attributable neither to the absence of a primary obligation nor to a want of political will alone, but to three technical obstacles which are peculiar to environmental damage: the difficulty of defining damage to the environment in itself as distinct from damage to persons and property; the difficulty of establishing causation where the harm is diffuse, cumulative or delayed; and the difficulty of valuing a loss which has no market price. It further hypothesises that the recent practice in the fields of climate change and plastic pollution reproduces this pattern rather than departing from it, the obligations having been elaborated while the consequences of their breach have been deferred.

Scholarship has not neglected the subject, but its treatments have run along two tracks which have seldom met. The first, and by far the more extensive, has been devoted to the elaboration of the obligation of prevention, to the standard of due diligence, and to the procedural requirements derived from them. The second has been devoted to civil liability regimes, and has been conducted largely by specialists in private international law and in maritime and nuclear law, with little reference to the general law of State responsibility. What is attempted here is to join the two by a single criterion: to follow the course of a claim from the establishment of the breach to the award of reparation, and to identify the point at which that course is interrupted.

The analytical method has been employed in dissecting the jurisprudence and the conventional texts, the historical method in following the development of the work of the International Law Commission, and the case-study method in appraising the recent practice. The study is divided into four axes: the first addresses the consolidation of the obligation of prevention; the second addresses the failure of the reparation track; the third addresses the technical obstacles; and the fourth addresses the contemporary practice as a test.

THE FIRST TOPIC: THE CONSOLIDATION OF THE OBLIGATION OF PREVENTION

The obligation not to cause significant transboundary harm is among the few rules of international environmental law whose customary status is not seriously contested, and its consolidation is the necessary point of departure for the analysis, since it is the disparity between it and the reparation track that constitutes the subject of this study.

FIRST REQUIREMENT: The jurisprudential line from Trail Smelter to the advisory opinions

The starting point is the Trail Smelter arbitration, in which the tribunal held that 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 when the case is of serious consequence and the injury is established by clear and convincing evidence[3]. Two features of that award deserve emphasis at the outset. The first is that it established the obligation of prevention and simultaneously awarded

[3] Trail Smelter Arbitration (United States v. Canada), Arbitral Awards of 16 April 1938 and 11 March 1941, Reports of International Arbitral Awards, vol. III, 1905.

compensation for the harm which had occurred, so that the two components were treated as a single question. The second is that the conditions it laid down, requiring serious consequence and clear and convincing evidence, anticipated the obstacles which would later prevent the development of the reparation track.

The obligation was thereafter generalised. In Corfu Channel the International Court of Justice stated the principle in its widest form, holding that every State is under an obligation not knowingly to allow its territory to be used for acts contrary to the rights of other States[4], In the Lac Lanoux arbitration the tribunal addressed the procedural aspect, holding that the upstream State is bound to take the interests of the downstream State into consideration[5]. The Stockholm Declaration of 1972 and the Rio Declaration of 1992 gave the rule declaratory expression in Principle 21 and Principle 2 respectively.

The decisive judicial affirmation came in 1996, when the Court held in its advisory opinion on nuclear weapons that the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment[6]. The formula is significant in two respects: it employs the term obligation rather than principle, and it extends the rule to areas beyond national jurisdiction, thereby detaching it from the bilateral structure within which it had developed. The Court reiterated the substance of the holding in Gabčíkovo-Nagymaros in the following year[7].

The line was extended in 2024 and 2025 to the gravest of contemporary environmental problems. The International Tribunal for the Law of the Sea held that anthropogenic greenhouse gas emissions constitute pollution of the marine environment within the meaning of the United Nations Convention on the Law of the Sea, and that States parties are under specific obligations to take all necessary measures to prevent, reduce and control such pollution[8]. The International Court of Justice held in July 2025 that States are under a customary obligation to prevent significant harm to the environment and to the climate system and to ensure that their acts and omissions do not cause harm to other States through such emissions[9].

[4] Corfu Channel (United Kingdom v. Albania), Merits, Judgment, ICJ Reports 1949, 4, 22.
[5] Lake Lanoux Arbitration (Spain v. France), Award of 16 November 1957, Reports of International Arbitral Awards, vol. XII, 281.
[6] Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, ICJ Reports 1996, 226, para. 29.
[7] Gabčíkovo-Nagymaros Project (Hungary/Slovakia), Judgment, ICJ Reports 1997, 7, para. 53.
[8] Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law, Case No. 31, International Tribunal for the Law of the Sea, Advisory Opinion of 21 May 2024, paras. 178, 243.
[9] Obligations of States in respect of Climate Change, Advisory Opinion of 23 July 2025, International Court of Justice, General List No. 187, paras. 272 et seq. [hereinafter cited as: Climate Change Advisory Opinion].

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The line is thus continuous over some eighty-five years, and it is unbroken. No decision has qualified the obligation, and no State has denied it in terms. It is upon this consolidated foundation that the disparity examined in the second axis must be appraised.

One qualification should be entered upon this survey. The consolidation described concerns the obligation as a proposition of law and not its observance in fact, and the distinction is material. A rule may be universally acknowledged and habitually breached, and the acknowledgment establishes only that a breach requires justification rather than that it will not occur. The relevance of this qualification to the present study is that the consolidation of the primary obligation is what renders the deficiency of the secondary obligation consequential: were the rule contested, the absence of a reparation mechanism would be one difficulty among several; the rule being settled, that absence becomes the operative obstacle, and the whole weight of the system falls upon it.

SECOND REQUIREMENT: The content of the obligation and its procedural elaboration

The consolidation of the obligation has been accompanied by an elaboration of its content, and this elaboration is the second measure of the disparity, since nothing comparable has occurred in respect of reparation.

The obligation is one of conduct rather than of result. It does not require that no harm occur, which would be an obligation impossible of performance in respect of activities that are lawful and necessary, but requires that the State employ all the means at its disposal to prevent harm arising from activities within its jurisdiction. This is the standard of due diligence, and the Court elaborated it in Pulp Mills, holding that the obligation entails not only the adoption of appropriate rules and measures but also a certain level of vigilance in their enforcement and in the exercise of administrative control[10].

Upon this basis the jurisprudence has derived a series of procedural requirements. The first and most significant is the obligation to carry out an environmental impact assessment, which the Court held in Pulp Mills to have become a requirement under general international law where a proposed industrial activity is liable to have a significant adverse transboundary impact, and whose scope it further clarified in the joined cases concerning the border area between Costa Rica and Nicaragua[11]. The second is the obligation to notify and to consult where such an assessment discloses a risk. The third is the obligation to cooperate in good faith with the State liable to be affected.

This elaboration was codified by the International Law Commission in its articles on the prevention of transboundary harm from hazardous activities, adopted in 2001, which set out the obligations of authorisation, of assessment, of notification and consultation, and of the exchange

[10] Pulp Mills on the River Uruguay (Argentina v. Uruguay), Judgment, ICJ Reports 2010, 14, para. 197.
[11] Ibid., para. 204; and Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua) and Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica), Judgment, ICJ Reports 2015, 665, para. 104.

of information[12]. The instrument is detailed and operational, and the Commission recommended to the General Assembly that a convention be elaborated upon its basis.

Two conclusions follow from this survey. The first is that the obligation of prevention is not merely affirmed but operational: it is capable of being applied to a determinate case and of yielding a determinate answer as to whether a State has complied with it. The second, which is the premise of the whole of this study, is that this operational character is confined to the anterior phase. The law tells a State with precision what it must do before harm occurs; it tells it very little as to what follows once harm has occurred notwithstanding.

It is convenient, before turning to the second axis, to state the relation between this obligation and certain principles with which it is frequently conflated. The precautionary principle, expressed in Principle 15 of the Rio Declaration, addresses the situation of scientific uncertainty, providing that a want of full certainty shall not be used as a reason for postponing measures; it accordingly alleviates the burden of proof at the stage of prevention and creates no independent obligation of reparation. The polluter-pays principle, expressed in Principle 16, is economic in origin, its content being the internalisation of environmental costs into the costs of production; it has been given extensive legislative effect within the European Union, but its status in general international law remains contested between those who regard it as customary and those who regard it as a policy direction. Principle 13 of the same instrument is the most closely relevant to the present study, calling upon States to develop national law regarding liability and compensation for environmental damage and to cooperate in developing international law in that respect. More than three decades have passed since that call and it has not been answered, which is itself evidence that the gap examined here has long been recognised rather than recently discovered.

THE SECOND TOPIC : THE FAILURE OF THE REPARATION TRACK

The disparity examined in this axis is not the product of neglect. Attempts were made to develop a reparation regime, and they failed; and the manner of their failure is more instructive than the fact of it.

FIRST REQUIREMENT: The division effected by the International Law Commission and its significance

The International Law Commission included in its programme of work in 1978 the topic of international liability for injurious consequences arising out of acts not prohibited by international law, a formulation which discloses the original ambition: to establish a regime of liability for harm arising from lawful activity, independently of the commission of any wrongful act[13]. Work upon the topic continued for some twenty years without the adoption of a text.

[12] Articles on Prevention of Transboundary Harm, cited above, arts. 6–13.
[13] The topic was included in the programme of work of the Commission in 1978 following the recommendation of the General Assembly in resolution 3071 (XXVIII) of 30 November 1973.

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In 1997 the Commission took the decision which is the pivot of this study: it divided the topic into two parts, addressing first the prevention aspects and deferring the liability aspects[14]. The division was presented as a matter of method, permitting progress upon the aspect susceptible of agreement while the other was further considered. Its consequences, however, were structural.

In 2001 the Commission completed the first part and adopted the articles on prevention, recommending to the General Assembly the elaboration of a convention upon their basis. In 2006 it completed the second part, adopting draft principles on the allocation of loss in the case of transboundary harm arising out of hazardous activities, and recommending that the Assembly endorse them by resolution and urge States to implement them[15]. The General Assembly took note of the principles in resolution 61/36 and commended them to the attention of governments, and thereafter commended both instruments in resolution 62/68 without prejudice to any further action[16].

The difference in the form of the two outputs is the point. The prevention component was completed as articles proposed for conversion into a convention; the liability component was completed as principles proposed for commendation. The difference is not one of drafting style: it reflects the assessment of the Commission itself as to the degree of consolidation attained by each component, and it constitutes an authoritative acknowledgment, emanating from the body charged with the codification and progressive development of international law, that the reparation track had not reached the stage at which it might be cast in binding form.

The content of the 2006 principles confirms this assessment. They rest upon the allocation of loss rather than upon the responsibility of States: the operator bears prompt and adequate compensation, supported by financial security and by industry funds, and the role of the State is residual, consisting in ensuring the availability of such mechanisms. The Commission thus displaced the question from the plane of inter-State responsibility to that of civil liability, which is a solution of considerable practical merit but which leaves the original question unanswered.

A further observation upon the 1997 division is required, since it has a consequence which is easily overlooked. The obligation of prevention and the obligation of reparation are not merely two aspects of a single subject; they are functionally interdependent. The standard of diligence required of a State is determined in part by the magnitude of the consequences of failure, and where those consequences are attenuated the standard is correspondingly deprived of its incentive effect. A State which knows that a breach will engage no financial consequence has no reason to invest in prevention beyond what its own interest dictates. The division of 1997, whatever its methodological merits, accordingly did not merely defer the second component: it

[14] International Law Commission, decision of 1997 to divide the topic into prevention of transboundary damage from hazardous activities and international liability in case of loss from transboundary harm arising out of hazardous activities.

[15] Principles on the Allocation of Loss, cited above, together with the recommendation of the Commission to the General Assembly.

[16] UN General Assembly, Resolution 61/36 of 4 December 2006, annex; and Resolution 62/68 of 6 December 2007, annex.

weakened the first, by detaching the standard of conduct from the consequence which would have given it force.

SECOND REQUIREMENT: The failure of the general conventions on civil liability

The displacement effected by the Commission presupposes the existence of effective civil liability regimes, and it is here that the second failure is to be found.

Sectoral regimes exist and function. Liability for oil pollution damage is governed by the Civil Liability Convention of 1969 as amended in 1992, supplemented by the Fund Convention, which together establish a system of strict liability channelled to the shipowner, compulsory insurance, and a supplementary fund financed by contributions from cargo interests. Liability for nuclear damage is governed by comparable instruments concluded at Paris in 1960 and at Vienna in 1963. These regimes are effective, and their effectiveness is instructive: each of them addresses a determinate activity, a determinate category of damage, and an identifiable operator, and each caps liability at a determinate figure. They resolve the technical obstacles examined in the third axis by confining their scope, not by overcoming them.

The attempts to establish general regimes have failed. The Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment, concluded at Lugano in 1993 under the auspices of the Council of Europe, was the most ambitious of them, adopting a wide definition of damage extending to impairment of the environment itself; it has not entered into force. The Protocol to the Basel Convention on liability and compensation for damage resulting from the transboundary movement of hazardous wastes, adopted in 1999, has likewise not entered into force. Annex VI to the Protocol on Environmental Protection to the Antarctic Treaty, adopted in 2005 and dealing with liability arising from environmental emergencies, has not entered into force either.

The pattern admits of a single explanation, and it is not political indifference: each of these instruments was negotiated to completion and adopted, which indicates that agreement upon the text was attainable. What was not attainable was ratification, and the obstacle to ratification is that a general regime requires States to accept an open-ended exposure the extent of which cannot be assessed in advance, because the definition of environmental damage is indeterminate, causation is difficult to establish, and the loss cannot be valued by reference to a market. It is to these three obstacles that the analysis must accordingly turn.

THE THIRD TOPIC : THE TECHNICAL OBSTACLES TO REPARATION FOR ENVIRONMENTAL DAMAGE

The failure examined in the preceding axis is attributable to three obstacles which are peculiar to environmental damage and which the ordinary rules of reparation were not devised to accommodate.

FIRST REQUIREMENT: The definition of damage and the problem of pure environmental harm

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The rules of reparation were constructed upon the premise of a determinate injury sustained by a determinate subject. Article 31 of the Articles on Responsibility of States for Internationally Wrongful Acts obliges the responsible State to make full reparation for the injury caused, injury comprising any damage whether material or moral[17], and Article 36 provides for compensation for any financially assessable damage[18]. The premise is that damage is assessable in financial terms because it consists in a loss sustained by a person or in respect of property.

Environmental damage does not readily conform to this premise. It is convenient to distinguish two categories. The first is damage to the environment which is reflected in injury to persons or property: the destruction of a crop, the contamination of a water supply relied upon by an identifiable community, the loss of income of fishermen. This category presents no difficulty of principle, since the loss is sustained by an identifiable subject and is assessable by reference to ordinary criteria; and it is this category which the sectoral regimes address.

The second is damage to the environment in itself, that is, the impairment of an ecosystem which is not reflected in any loss sustained by a determinate person: the extinction of a species, the degradation of a habitat in an area beyond national jurisdiction, the reduction of the capacity of a natural system to perform its functions. This category, commonly designated pure environmental damage, is the source of the difficulty. Who is the injured subject? By reference to what criterion is the loss to be assessed? And what does restitution mean where the impairment is irreversible?

The instruments have addressed the question with marked caution. The 1992 Civil Liability Convention confines compensation for impairment of the environment, other than loss of profit resulting from such impairment, to the costs of reasonable measures of reinstatement actually undertaken or to be undertaken. The formula is a compromise: it admits pure environmental damage into the sphere of compensation, but measures it by reference to the cost of reinstatement rather than by reference to the value of the impairment, thereby avoiding the valuation problem by converting it into a question of expenditure.

This technique has been widely followed, and it has a considerable practical merit and a corresponding conceptual cost. The merit is that it yields a determinate figure. The cost is that it under-compensates systematically, since the cost of reinstatement bears no necessary relation to the value of what has been lost, and since it yields nothing at all where reinstatement is impossible, which is precisely the case of the gravest harm.

A related difficulty concerns the identification of the claimant. Where the harm affects an area beyond national jurisdiction, no State is injured in the ordinary sense, and the question arises whether any State may claim reparation and, if so, to whom the sum awarded is to be paid. The determination of the International Court of Justice in 2025 that the customary obligations

[17] International Law Commission, Articles on Responsibility of States for Internationally Wrongful Acts, 2001, art. 31 [hereinafter cited as: Articles on State Responsibility].
[18] Ibid., art. 36; and see James Crawford, State Responsibility: The General Part (Cambridge: Cambridge University Press, 2013), chap. 14.

relating to the protection of the environment are obligations erga omnes bears directly upon the first limb of this question, since it establishes that all States have a legal interest in their performance and that any State may invoke responsibility[19]. It does not, however, resolve the second: Article 48 of the Articles on State Responsibility permits a State other than an injured State to claim performance of the obligation of reparation in the interest of the injured State or of the beneficiaries of the obligation breached, but where the beneficiary is the environment itself there is no person to whom payment may be made, and no mechanism has been established to receive it. The obstacle is procedural rather than substantive, but it is not on that account less effective.

SECOND REQUIREMENT: Causation and valuation

The second obstacle is causation. The ordinary rule requires a sufficient causal link between the wrongful act and the injury for which reparation is claimed, and the establishment of such a link presents no difficulty where an identified discharge from an identified installation has produced an identified harm in a neighbouring State, which is the paradigm of the Trail Smelter award.

Contemporary environmental harm does not conform to this paradigm in three respects. It is frequently cumulative, resulting from the aggregate of numerous sources no one of which would have produced the harm alone. It is frequently delayed, the harm manifesting itself years or decades after the conduct which produced it, by which time the evidentiary record has deteriorated. And it is frequently synergistic, the harm resulting from the interaction of several factors in a manner which resists apportionment among them.

The International Court of Justice addressed this difficulty in 2025 in the climate context, declining to lay down a general test of causation but rejecting the proposition that the complexity of the phenomenon precludes the engagement of responsibility, and observing that it is scientifically possible to determine the total contribution of each State to global emissions[20]. The holding transfers the question from the domain of legal impossibility to that of evidence, which is a defensible course; but it leaves unresolved the step upon which everything depends, namely the attribution of a determinate injury to a determinate contribution.

The third obstacle is valuation, and it is the least discussed and the most intractable. Compensation presupposes that the loss can be expressed in a sum of money, and the ordinary method is reference to a market price. An ecosystem has no market price. Two methods have been developed to circumvent this: valuation by reference to the cost of restoration, and valuation by reference to the services which the natural system provides, whether by reference to the cost of replacing them or by reference to what those benefiting from them would be willing to pay for their preservation.

[19] Climate Change Advisory Opinion, cited above, paras. 439–443; and Articles on State Responsibility, cited above, art. 48.
[20] Climate Change Advisory Opinion, cited above, paras. 429, 438.

Each method has been criticised. The restoration method under-compensates where restoration is partial and yields nothing where it is impossible. The ecosystem services method has been criticised as speculative and as resting upon assumptions which are not susceptible of judicial verification. The absence of an agreed method is a material cause of the failure of the general conventions, since a State cannot assess an exposure whose measure is undetermined.

To these three obstacles must be added a fourth of a different order, namely the absence of a forum. A claim for reparation as between States requires a basis of jurisdiction, and multilateral environmental agreements seldom contain a dispute settlement clause establishing compulsory jurisdiction; where such a clause exists, as under the United Nations Convention on the Law of the Sea, the proceedings brought upon its basis have concerned navigation and fisheries rather than environmental reparation. It follows that an injured State, even were it to surmount the obstacles of definition, causation and valuation, may find no competent tribunal before which to bring its claim. This obstacle is institutional rather than technical, and it falls outside the three examined above; but its practical effect is comparable to theirs taken together.

THE FOURTH TOPIC : THE CONTEMPORARY PRACTICE AS A TEST

The foregoing analysis may be tested against the practice, and two developments permit its appraisal: the single occasion upon which the International Court of Justice has awarded compensation for environmental damage, and the treatment of the question in the two principal environmental processes of the present decade.

FIRST REQUIREMENT: The compensation judgment of 2018 and its significance

In February 2018 the International Court of Justice delivered its judgment upon compensation in the case concerning certain activities carried out by Nicaragua in the border area, the merits having been determined in 2015. It was the first occasion upon which the Court adjudicated upon compensation for environmental damage, and its reasoning accordingly repays close attention[21].

The Court held that damage to the environment and the consequent impairment or loss of the ability of the environment to provide goods and services is compensable under international law, a holding of the first importance since it admits pure environmental damage into the sphere of compensation as a matter of general international law rather than of any particular treaty. It further held that compensation may be awarded for the impairment or loss of environmental goods and services in the period prior to recovery, and for the costs of restoration.

The Court declined, however, to adopt either of the valuation methods advanced by the parties, observing that international law does not prescribe any specific method and that it must be guided by the circumstances of each case. It proceeded to an overall assessment rather than to an itemised calculation, and awarded a total sum below four hundred thousand United States dollars.

[21] Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua), Compensation, Judgment, ICJ Reports 2018, 15.

The significance of the judgment for the present study is twofold and the two aspects point in opposite directions. Upon the one hand, it establishes the principle: pure environmental damage is compensable, and the absence of a market price is not an obstacle. Upon the other, the magnitude of the award and the method by which it was reached illustrate the difficulty rather than resolving it. An overall assessment is a technique appropriate to a case in which the evidence does not permit precision; it is not a method capable of general application, and it affords no guidance to a State seeking to assess its exposure in advance. The Court supplied the principle and withheld the method, and it is the method that the reparation track has always wanted.

The judgment invites a comparison with the award from which this study set out. In Trail Smelter the tribunal established the obligation and awarded compensation in a single instrument, the sum awarded bearing a demonstrable relation to the harm proved. Some eighty years later the Court affirmed the principle in wider terms while awarding a sum which is, in relation to the magnitude of contemporary environmental harm, symbolic. The comparison should not be pressed too far, the two cases differing in their facts and in the evidence adduced. But it does dispose of one explanation sometimes offered for the state of the reparation track, namely that it is a young branch which has not yet had time to develop. The reparation track is not young: it is as old as the obligation itself, and it was in 1941 in a condition arguably more advanced than that in which it stands today.

SECOND REQUIREMENT: Climate and plastics — reparation deferred

The two principal environmental processes of the present decade reproduce the pattern identified in this study, and their examination confirms that the dissociation is structural rather than historical.

The climate process furnishes the clearer illustration. The advisory opinion of the International Court of Justice of 23 July 2025 elaborated the obligations of States in considerable detail, holding that the climate change treaties do not constitute lex specialis excluding the general rules, that the customary obligation of prevention extends to the climate system, and that its breach entails the ordinary consequences of State responsibility including full reparation[22]. The Court thus affirmed the reparation track in terms. But it declined to lay down a test of causation, and it did not address the valuation of climate harm at all; and the institutional follow-up, in the shape of the resolution adopted by the General Assembly on 20 May 2026 by a divided vote, established a process of political follow-up rather than a mechanism of accountability[23]. The obligations were elaborated; the consequences were deferred.

The plastics process furnishes the starker illustration, since the question of reparation has not arisen at all. The negotiation of an international legally binding instrument on plastic pollution

[22] Climate Change Advisory Opinion, cited above, paras. 171, 272 et seq., 407 et seq.
[23] UN General Assembly, "Advisory Opinion of the International Court of Justice on the Obligations of States in respect of Climate Change," A/RES/80/263 (20 May 2026).

was initiated by resolution 5/14 of the United Nations Environment Assembly in March 2022, with a mandate to complete the instrument by the end of 2024[24]. The fifth session held at Busan in December 2024 failed to produce a text; the resumed session held at Geneva from 5 to 15 August 2025, attended by delegations from one hundred and eighty-three States, was adjourned without consensus[25]; and the further resumed session convened on 7 February 2026 was confined to the election of a new chairman following the resignation of his predecessor, no substantive negotiation being held[26].

The matters upon which the negotiations foundered are instructive. They concerned the scope of the instrument, and in particular whether it would regulate the production of primary polymers or would be confined to waste management; the treatment of chemicals of concern; the design of the financial mechanism; and whether decisions were to be taken by consensus or by vote[27]. What is significant for the present study is what is absent from that list: the question of liability for the harm already caused has not featured among the contested issues, for the sufficient reason that it has not been seriously proposed. A process which cannot agree upon the scope of a prospective obligation is not in a position to address the consequences of past breach.

It should be observed, in fairness to the process, that this is not a peculiarity of the plastics negotiations. The framework conventions in the fields of climate, biological diversity and ozone were likewise concluded without liability provisions, the question being either omitted or deferred to a protocol which was never concluded. The pattern is general, and it is the pattern which this study has sought to describe: the international community legislates prevention and defers reparation, and the deferral has now extended over half a century.

Conclusion:

This study has concluded that international responsibility for transboundary environmental harm is incomplete in a determinate and identifiable respect. Its primary component is consolidated: the obligation of prevention rests upon an unbroken line of jurisprudence extending over some eighty-five years, its content has been elaborated into determinate procedural requirements, and it was extended in 2025 to the climate system itself. Its secondary component is not: the mechanisms by which reparation is to be secured have remained at the stage at which the International Law Commission left them in 2006, which is the stage of non-binding principles.

The cause of this dissociation is neither the absence of a primary obligation nor political indifference alone. It resides in three technical obstacles which the ordinary rules of reparation

[24] United Nations Environment Assembly, Resolution 5/14, "End Plastic Pollution: Towards an International Legally Binding Instrument," UNEP/EA.5/Res.14 (2 March 2022).
[25] Intergovernmental Negotiating Committee on Plastic Pollution, second part of the fifth session (INC-5.2), Geneva, 5–15 August 2025, adjourned without consensus.
[26] Intergovernmental Negotiating Committee on Plastic Pollution, third part of the fifth session (INC-5.3), Geneva, 7 February 2026, convened for organisational purposes only.
[27] See the report of the Committee upon the work of the second part of its fifth session.

were not devised to accommodate, namely the definition of damage to the environment in itself, the establishment of causation where the harm is cumulative or delayed, and the valuation of a loss which has no market price. The sectoral regimes which function do so because they confine their scope so as to avoid these obstacles rather than by overcoming them, and the general regimes which would have confronted them have not entered into force.

Two general observations follow. The first is that the deficiency identified is not peculiar to environmental law but is a particular instance of a difficulty affecting international law as a whole, namely that its primary rules have developed more rapidly than the mechanisms by which their breach is answered. The environmental field is the clearest illustration of that difficulty because the disparity there is measurable: the obligation is dated to 1941 and the single award of compensation to 2018. The second is that the diagnosis carries its own prescription. If the obstacles are technical rather than political, then the remedy lies in technical work, and in particular in the elaboration of an agreed method of valuation; and technical work of that kind does not require the political conditions which the negotiation of a convention requires. This is the ground for such optimism as the present analysis permits.

Results:

1- The obligation not to cause significant transboundary environmental harm rests upon an unbroken jurisprudential line running from the Trail Smelter award through the advisory opinion of 1996 to the advisory opinions of 2024 and 2025, and no decision has qualified it and no State has denied it in terms.

2- The obligation has been elaborated into an operational standard of due diligence entailing determinate procedural requirements, foremost among them the obligation to carry out an environmental impact assessment, which the International Court of Justice held in 2010 to have become a requirement of general international law.

3- The division of the subject effected by the International Law Commission in 1997, and the completion of the prevention component as articles proposed for a convention while the liability component was completed as principles proposed for commendation, constitutes an authoritative acknowledgment by the body charged with codification that the reparation track had not attained the degree of consolidation permitting binding form.

4- The general conventions on civil liability for environmental damage concluded at Lugano in 1993, under the Basel Convention in 1999 and under the Antarctic Protocol in 2005 have not entered into force, whereas the sectoral regimes in the fields of oil pollution and nuclear damage function effectively; the difference is that the latter confine their scope so as to avoid the technical obstacles rather than overcoming them.

5- Three technical obstacles account for the failure of the reparation track: the difficulty of defining pure environmental damage as distinct from damage to persons and property; the difficulty of establishing causation where the harm is cumulative, delayed or synergistic; and the absence of an agreed method for valuing a loss having no market price.

6- The compensation judgment of 2018 established the principle that pure environmental damage is compensable under general international law, but the Court declined to adopt any valuation method and proceeded to an overall assessment yielding a sum below four hundred thousand United States dollars, so that the principle was supplied and the method withheld.

7- The contemporary practice reproduces the pattern rather than departing from it: the advisory opinion of 2025 elaborated the climate obligations while deferring causation and valuation, and the negotiations upon plastic pollution, adjourned without agreement in August 2025 and resumed in February 2026 for organisational purposes only, have not addressed liability at all.

Recommendations:

1- Reverting to the recommendation of the International Law Commission that a convention be elaborated upon the basis of the 2001 articles on prevention, and coupling it with a protocol upon reparation, so that the two components are negotiated together rather than the second being deferred as it was in 1997.

2- Directing the attention of scholarship and of practice to the elaboration of an agreed method for the valuation of environmental damage, since the absence of such a method is the obstacle which is least susceptible of resolution by political will and the one upon which the general conventions have foundered.

3- Adopting, in future instruments, the technique of a determinate cap upon liability coupled with a supplementary fund financed by the industry concerned, upon the model of the oil pollution regime, since that technique permits States to assess their exposure in advance and has proved the only one capable of attracting ratification.

4- Introducing into the negotiations upon plastic pollution, at the stage of substantive negotiation now to be resumed, a provision upon liability and compensation even in framework terms, so that the question is not deferred to a protocol which experience indicates is unlikely to be concluded.

5- Developing, within the framework of the International Law Commission, a set of guidelines upon causation in respect of cumulative and diffuse harm, drawing upon the treatment of multiple causation in national legal systems, since the International Court of Justice expressly declined in 2025 to lay down a general test.

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