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Protecting Future Generations Through International Environmental Law

Protezione delle generazioni future attraverso il diritto internazionale ambientale

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Abstract

The protection of future generations is one of the most difficult challenges facing international environmental law. Environmental and climate harm caused today may unfold over decades or centuries, while those who will bear many of its consequences have no direct representation in present political or judicial processes. This thesis examines the extent to which existing international environmental law adequately protects the interests of future generations and considers which legal mechanisms could narrow the gap between intergenerational equity as a normative principle and obligations capable of practical enforcement. The study adopts primarily a doctrinal method, analysing treaties, customary international law, general principles, soft-law instruments and international jurisprudence. Particular attention is given to sustainable development, the precautionary principle, due diligence, the no-harm rule, and the principal treaty regimes governing climate change, biodiversity and the marine environment. The thesis also provides a detailed analysis of the 2024 ITLOS Advisory Opinion and the 2025 ICJ Advisory Opinion on climate change, read alongside relevant international human-rights jurisprudence, including Inter-American Advisory Opinions OC-23/17 and OC-32/25. The analysis finds that international law increasingly recognises the intergenerational dimension of environmental protection and that recent judicial developments have clarified the content of several State obligations. Significant limitations nevertheless remain in enforcement, representation of future generations, institutional fragmentation, and the translation of general standards into operational duties. The thesis concludes by proposing legal and institutional reforms aimed at strengthening intergenerational representation, compliance review and the consistent use of the best available science in long-term environmental decision-making.

Keywords: future generations; intergenerational equity; international environmental law; climate change; due diligence; ITLOS; ICJ.

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Abbreviations

CBD ----------Convention on Biological Diversity

CBDR-RC ----------Common but Differentiated Responsibilities and Respective Capabilities

CRC ----------Convention on the Rights of the Child

IACtHR ---------- Inter-American Court of Human Rights

ICJ ---------- International Court of Justice

IPCC----------Intergovernmental Panel on Climate Change

ITLOS---------- International Tribunal for the Law of the Sea

NDC----------Nationally Determined Contribution

OHCHR---------- Office of the United Nations High Commissioner for Human Rights

UN ---------- United Nations

UNCLOS ---------- United Nations Convention on the Law of the Sea

UNFCCC ----------United Nations Framework Convention on Climate Change

UNGA---------- United Nations General Assembly

Structure of the Thesis

This thesis is organised into four chapters, moving from the theoretical foundations of intergenerational equity to positive international environmental law, and recent international jurisprudence, followed by critical evaluation, reform proposals and conclusions within Chapter 4. Chapter 1 introduces the research problem, research question, hypotheses, objectives, methodology and relevant literature.

Chapter 2 develops the theoretical framework of intergenerational equity and sustainable development. Chapter 3 examines treaties, customary rules, general principles and human-rights obligations relevant to future generations.

Chapter 4 analyses the 2024 ITLOS Advisory Opinion and the 2025 ICJ Advisory Opinion on climate change, together with relevant human-rights jurisprudence. It then evaluates the adequacy and enforcement gaps in the existing framework, develops reform proposals, and concludes the thesis.

Chapter 1: Setting the Scene

1.1 Background and Significance of the Topic

In legal literature, the connection between international law and safeguarding future generations has long been marginalised, frequently viewed as a philosophical issue rather than a legally binding duty. But as environmental degradation has accelerated over the past 50 years, particularly due to the climate crisis, the international legal community has been forced to address a fundamental question: Does current law impose meaningful duties on present-day States to protect the world they will leave behind? This discussion has its roots in the Stockholm Declaration of 1972[1], which established the need to preserve the environment 'for present and future generations.' The Brundtland Commission defined sustainable development as development that 'meets the needs of the present without compromising the ability of future generations to meet their own needs.'[2] This idea was developed at the Rio Earth Summit in 1992[3]. However, the conversion of intergenerational rhetoric into legally binding obligations has proven elusive despite decades of treaty-making, from the 1992 United Nations Framework Convention on Climate Change (UNFCCC)[4] to the 2015 Paris Agreement. The gap between normative ambition and legal enforcement has grown increasingly difficult to ignore. The scientific evidence shows that the consequences of present emissions will unfold across generations, affecting persons who have no representation in today's political or legal systems. The Intergovernmental Panel on Climate Change (IPCC) has repeatedly cautioned that if global warming is not kept to 1.5°C above[5] pre-industrial levels, permanent harm will result, including rising sea levels, extreme weather events, and a decline in biodiversity, with future generations bearing the greatest burden of harm.

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[1]Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration) (adopted 16 June 1972) UN Doc A/CONF.48/14/Rev.1, principle 1.

[2]United Nations, 'Backgrounder: Brundtland Commission' (United Nations, nd) <https://www.un.org/esa/sustdev/csd/csd15/media/backgrounder_brundtland.pdf> accessed 20 May 2026.

[3]Geoffrey Palmer, 'The Earth Summit: What Went Wrong at Rio?' (1992) 70(4) Washington University Law Quarterly 1005, 1011.

[4]United Nations Framework Convention on Climate Change (adopted 9 May 1992, entered into force 21 March 1994) 1771 UNTS 107, art 3(1).

[5]Intergovernmental Panel on Climate Change, *Global Warming of 1.5°C*: An IPCC Special Report on the Impacts of *Global Warming of 1.5°C* Above Pre-industrial Levels and Related Global Greenhouse Gas Emission Pathways (IPCC 2018) 4 <https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_High_Res.pdf> accessed 1 May 2026.

This temporal asymmetry raises a fundamental legal challenge: how can international law, a system built on the reciprocity and consent of currently existing States, generate enforceable duties whose beneficiaries are future persons with no present legal standing? These developments have not occurred in isolation. In its advisory opinion of May 2024, the International Tribunal for the Law of the Sea (ITLOS)[6] confirmed that States have specific obligations under UNCLOS — in particular under Articles 192 and 194 — to protect and preserve the marine environment from the adverse effects of anthropogenic greenhouse gas emissions. On 23 July 2025, the International Court of Justice (ICJ)[7] issued its own landmark advisory opinion on the obligations of States in respect of climate change. The Court treated the 1.5°C threshold as the parties' agreed primary temperature goal under the Paris Agreement and confirmed that States parties are bound by obligations of conduct — including due diligence, mitigation, adaptation, cooperation, and the preparation and implementation of nationally determined contributions adequate to contribute to that objective. Rather than creating an absolute obligation of result, the Court clarified that the 1.5°C goal operates as a legal benchmark against which the adequacy and ambition of State conduct must be assessed. This Advisory Opinion represents the most comprehensive judicial engagement with the international law applicable to climate change undertaken by any international court. Together, these advisory opinions represent a shift in the terms on which intergenerational protection is discussed within international law. The ICJ confirmed that States may incur international legal responsibility through both acts and omissions that contribute to climate harm[8].

The significance of this clarification lies not in creating new obligations but in specifying what existing obligations require and what consequences follow from their breach. The importance of this issue extends beyond climate change. The idea that current generations have legal obligations to future generations has ramifications for a variety of environmental regimes, from freshwater protection and ocean governance to nuclear waste management and biodiversity conservation. International law must create coherent and enforceable mechanisms for intergenerational

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[6]International Tribunal for the Law of the Sea, *Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law* (Advisory Opinion, 21 May 2024) <https://www.itlos.org/fileadmin/itlos/documents/cases/31/Advisory_Opinion/C31_Adv_Op_21.05.2024_orig.pdf > accessed 15 May 2026.

[7]International Court of Justice, *Obligations of States in respect of Climate Change* (Advisory Opinion, 23 July 2025) <https://www.icj-cij.org/node/205614> accessed 25 May 2026.

[8]ibid.

protection if it is to continue serving as a legitimate foundation for global governance. The degree to which it now does so is examined in this thesis, along with the necessary adjustments to reduce the gap.

1.1.1 Climate Change as an Intergenerational Legal Problem

Climate change gives the problem of future generations an unusually concrete legal form. Greenhouse gases emitted today remain relevant to the climate system over long time horizons, while warming, sea-level rise, ocean acidification, biodiversity loss and adaptation costs are distributed across time as well as across territory. The legal difficulty is therefore not merely that future persons may be affected by present conduct. It is that many of the most consequential decisions are taken before those persons can participate in the institutions that authorise, regulate or review the conduct in question. International environmental law must consequently address a structural mismatch between the temporal scale of environmental harm and the predominantly present-oriented design of legal and political decision-making.

This temporal mismatch matters for the characterisation of State obligations. A legal regime concerned only with immediate transboundary injury may respond too late to cumulative environmental processes whose effects become difficult or impossible to reverse. Climate law has therefore increasingly relied on anticipatory forms of regulation: prevention, due diligence, environmental impact assessment, precaution, long-term mitigation pathways and adaptation planning. These techniques do not create a complete law of future generations, but they provide doctrinal mechanisms through which future interests can enter the interpretation and application of existing obligations.

The 2025 Advisory Opinion of the International Court of Justice is especially important in this respect. The Court treated intergenerational equity as a guiding principle relevant to the interpretation and application of the rules governing climate change and connected it to the need to have due regard for the interests of future generations and the long-term implications of State conduct. This development strengthens the analytical premise of this thesis: the legal protection of future generations need not depend upon recognition of an autonomous catalogue of rights held by unborn persons. It may also operate through the content, intensity and procedural requirements of obligations already binding upon States.

1.2 Research Question and Hypotheses

1.2.1 Research Question

The central question guiding this thesis is: To what extent does existing international environmental law adequately protect the interests of future generations, and what legal mechanisms are needed to bridge the gap between intergenerational equity theory and enforceable obligations? This is an evaluative question rather than a simple inquiry into whether future generations are mentioned in international instruments. For the purposes of this thesis, the adequacy of the existing framework is assessed through four related questions: whether the relevant norm is legally binding; whether its content is sufficiently clear to guide and constrain State conduct; whether compliance can be monitored and a breach can lead to legal consequences; and whether there is a procedure through which the interests of future generations can be represented. These criteria are used throughout the doctrinal and case-study chapters. The second part of the research question asks what reforms are needed where one or more of these elements are missing.

1.2.2 Scope of the Research Question

The research question operates at two levels. At the descriptive-doctrinal level, the thesis maps the relevant treaties, customary rules, soft-law instruments, and judicial decisions in order to identify the obligations that already bear on the interests of future generations. At the normative-evaluative level, those materials are assessed against the four criteria set out above and against the account of intergenerational equity developed in Chapter 2. This makes it possible to distinguish between legal recognition, which is now widespread, and legal protection that is sufficiently clear, reviewable, and institutionally supported. The question is inevitably limited. Although comparable references are offered when appropriate, it concentrates on public international law rather than conducting a systematic comparative survey of domestic constitutional frameworks. Rather than seeking to resolve the philosophical question of whether persons not yet born can hold rights in the strict legal sense — a question that is addressed but set aside in favour of a functional legal analysis — the thesis treats future generations as a collective legal interest capable of grounding present obligations.

1.2.3 Hypotheses

Three working hypotheses structure the inquiry: Hypothesis 1 — The adequacy gap. International environmental law recognises the interests of future generations in a growing number of instruments, but that recognition does not consistently translate into clear and operative duties. The expected gap is therefore not simply between soft law and treaty law, but between formal recognition and rules that can meaningfully guide, assess, and constrain State conduct. Hypothesis 2 — The enforcement deficit. Even where relevant treaty or customary obligations exist, the institutions available to supervise and enforce them remain limited. International adjudication is generally consent-based and State-centred, while environmental treaty regimes tend to rely on reporting, review, and cooperation rather than compulsory remedies. As a result, the interests of future generations depend largely on present States or institutions choosing to represent them. Hypothesis 3 — The potential of recent judicial developments. The 2024 ITLOS Advisory Opinion and the 2025 ICJ Advisory Opinion may narrow the first two gaps by clarifying the content of obligations that already arise under treaties and customary international law. Their significance should therefore be assessed not by treating the opinions themselves as new binding sources, but by asking whether their reasoning makes existing duties more precise, reviewable, and usable in later litigation and compliance processes.

The three hypotheses address different parts of the same problem. The first concerns the legal content of intergenerational protection, the second concerns the institutions through which that content can be given effect, and the third asks whether recent judicial interpretation has materially changed either position. The thesis tests each hypothesis separately before considering how the findings fit together. A finding that judicial clarification has strengthened existing obligations would not, by itself, establish that the wider enforcement and representation problems have been resolved.

1.2.4 Scope, Delimitations and Analytical Assumptions

The thesis is deliberately confined to public international law, with international environmental law and climate-change law at its centre. Domestic constitutional litigation is used selectively where it illustrates broader questions of representation, standing or intergenerational reasoning, but the thesis does not attempt a comprehensive comparative survey of national climate litigation. Likewise, the analysis does not treat every policy question affecting future generations. Its focus

is environmental and climatic harm because this field provides the clearest body of treaties, customary rules, judicial decisions and institutional practice through which intergenerational interests can be legally examined.

A second delimitation concerns the distinction between moral responsibility and legal obligation. The thesis accepts that philosophical theories of justice help explain why future interests matter, but it does not infer binding law directly from moral theory. Instead, the doctrinal inquiry asks where intergenerational considerations are reflected in recognised sources and interpretive practices of international law. This distinction is essential because a persuasive ethical argument for protecting future persons does not, without more, establish a treaty obligation, customary rule or general principle of law.

Finally, the thesis distinguishes substantive protection from procedural representation. A legal rule may protect future interests indirectly — for example, by requiring prevention of significant environmental harm — even when future generations possess no independent standing before an international court. Conversely, an institution may give long-term interests a voice without creating new substantive environmental duties. The adequacy of the international framework must therefore be assessed along both dimensions.

1.3 Objectives

This thesis has four interlinked aims, each of which is aligned with a dimension of the overarching research issue. Each aim builds on the last, moving from the theoretical question of why future generations should be treated as beneficiaries of legal obligations, through a doctrinal mapping of what existing law actually requires, to an institutional analysis of why those requirements so frequently fail in practice, and finally to a jurisprudential assessment of whether recent judicial developments change that picture.

The initial aim is to set out the conceptual framework within which the thesis is operating. The proposition that present generations bear legal obligations towards those who will come after them is not self-evident within conventional legal thought. Achievement of this goal, therefore, requires engagement with the foundational scholarship on intergenerational equity. Engagement with broader debates in political philosophy concerning the moral status of future persons is also necessary. The goal is not to settle these disputes definitively, but to articulate a functional model

of intergenerational justice that is theoretically plausible and practically useful for legal analysis. This conceptual background is needed in order to evaluate whether the laws and processes reviewed in the following chapters achieve what is required by intergenerational equity.

The second aim is doctrinal and analytical. This requires a rigorous analysis of the main sources of international environmental law — treaties, customary international law, general principles and soft law instruments — in order to assess the extent to which they produce obligations of an intergenerational nature. This includes an analysis of landmark instruments such as the 1972 Stockholm Declaration, the 1992 Rio Declaration and Agenda 21, the UNFCCC and its Kyoto Protocol, the 2015 Paris Agreement, and the Convention on Biological Diversity, as well as the foundational principles of sustainable development, the precautionary principle and the no-harm rule. The objective is not merely to list these instruments, but to assess their legal character: whether they create binding obligations, the degree to which these obligations are precise, and the extent to which they enshrine the interests of future generations as a matter of substantive law rather than rhetorical flourish.

The third aim shifts attention from the content of legal obligations to the conditions under which they are implemented and enforced. Even precisely drafted obligations remain fragile if the legal system lacks effective means of supervision, compliance and, where necessary, responsibility. This part of the thesis therefore examines the procedural and institutional terrain: the role of the International Court of Justice, the International Tribunal for the Law of the Sea and other adjudicatory bodies; the mainly facilitative compliance functions of treaty bodies under major environmental agreements; and the structural barriers — including standing, causation and temporal distance — that make it difficult for future generations to be represented in international legal proceedings. The purpose is not only to identify where the design fails, but also to explain why it fails, thereby laying the groundwork for the reform proposals developed in the conclusion.

The fourth aim is jurisprudential. It examines the 2024 ITLOS Advisory Opinion and the 2025 ICJ Advisory Opinion as the two most authoritative judicial statements to date on States' climate obligations and their long-term consequences, read together with the human-rights jurisprudence — principally the Inter-American Court's Advisory Opinions OC-23/17 and OC-32/25 — that has developed alongside them. The analysis asks what each body actually held, what each left open, how their reasoning relates to earlier jurisprudence and to one another, and whether, individually

and cumulatively, they change the legal position of future generations in practice. It does not assume that either Opinion is transformative simply because it is recent. The aim is to distinguish genuine doctrinal development from authoritative restatement and to identify the limits that remain.

1.4 Methodology

The thesis relies primarily on doctrinal analysis: the systematic examination of legal sources in order to identify, interpret and evaluate the rules and principles they contain. The relevant sources are those reflected in Article 38(1) of the Statute of the International Court of Justice: international conventions, international custom, general principles of law and, as subsidiary means, judicial decisions and the writings of leading publicists. The analysis therefore draws on all four categories, with particular emphasis on treaty law and judicial pronouncements as the clearest expressions of the legal duties of States in this field.

Doctrinal analysis is not treated here as a purely descriptive exercise. It requires interpretation: asking what treaty provisions mean, how their scope has been understood by courts and treaty bodies, and how different instruments fit together when they point in different directions. Where the law is ambiguous or contested, the thesis engages with competing interpretations and assesses them against the theoretical framework developed in Chapter 2. The aim is to keep the analysis grounded in the formal sources of international law while remaining attentive to the normative stakes of intergenerational protection.

Because the research question concerns adequacy, the thesis applies a consistent evaluative framework. First, it considers the legal status of the relevant rule and whether it is binding. Second, it asks whether the rule is precise enough to provide a meaningful standard for State conduct. Third, it examines the available mechanisms of monitoring, compliance, responsibility, and remedy. Fourth, it considers representation: whether any actor or institution can place the interests of future generations before the relevant decision-making or adjudicative body. Intergenerational equity provides the normative benchmark for this assessment, particularly the preservation of options, environmental quality, and access for those who come after.

A further methodological issue concerns the distinction between obligations of conduct and obligations of result. Many environmental duties take the form of due diligence. The occurrence

of serious harm does not automatically establish a breach; the legal question is whether the State adopted measures reasonably capable of preventing or reducing that harm in light of the risk, available knowledge, and applicable standard of care. In the climate context, the Paris Agreement's temperature goals and the best available scientific evidence are relevant benchmarks, but the assessment remains focused on the adequacy of State conduct rather than a guaranteed environmental outcome.

Comparative and jurisprudential materials are used selectively. The thesis does not attempt a systematic comparison of domestic legal systems. Instead, domestic constitutional and judicial developments are considered where they show how international standards are being applied or where they provide useful institutional models. Decisions such as *Urgenda* and the German Constitutional Court's climate order are treated as persuasive examples, not as proof that a universal customary rule has already emerged. They come from a limited group of jurisdictions and cannot, without broader and representative State practice accompanied by *opinio juris*, establish custom on their own.

Chapter 4 provides the principal case study of the thesis: a jurisprudential examination of the 2024 ITLOS Advisory Opinion and the 2025 ICJ Advisory Opinion, read as complementary rather than sequential objects of analysis. Both are read closely, situated within the doctrinal framework developed in Chapters 2 and 3, and compared directly with one another before being placed alongside two opinions of the Inter-American Court of Human Rights: the earlier Advisory Opinion OC-23/17 on the environment and human rights, and the Court's more recent Advisory Opinion OC-32/25 on the climate emergency and human rights, delivered on 29 May 2025 at the request of Chile and Colombia, which addresses the scope of States' substantive and procedural human rights obligations — including an enhanced standard of due diligence — in responding to the climate emergency.

The choice to centre the case study on the ITLOS and ICJ Advisory Opinions, rather than on a comparative study of domestic climate litigation, reflects the doctrinal orientation of the thesis as a whole. Read together, the two Opinions are, to date, the most comprehensive judicial engagement with the international law applicable to climate change, drawing together the law of the sea, treaty law, customary international law, and human rights obligations within two authoritative pronouncements delivered fourteen months apart; they therefore offer the most direct test of the

doctrinal framework developed in Chapters 2 and 3, and their comparison offers a further check on that framework, since the degree to which two differently constituted international judicial bodies converge on substantially the same due-diligence standard is itself evidence of that standard's doctrinal solidity. A systematic comparative analysis of domestic case law — such as *Urgenda*, the German Constitutional Court's climate order, or the Colombian *Future Generations* decision discussed in Chapter 3 — would constitute a valuable and arguably more innovative research project in its own right, but would require a different methodology, oriented towards comparative constitutional law rather than the doctrinal mapping of public international law undertaken here. Those decisions are accordingly treated, as noted above, as persuasive illustrations of an emerging judicial trend rather than as the primary object of analysis.

1.4.1 Methodological Limits and Source Hierarchy

The analysis gives priority to primary legal materials: treaties, United Nations resolutions and declarations, advisory opinions and judgments of international courts and tribunals, and relevant institutional documents. Secondary scholarship is used to identify doctrinal debates, competing interpretations and conceptual frameworks, but it is not treated as a substitute for evidence of positive law. This hierarchy is particularly important in a field in which the language of responsibility to future generations is widespread but its precise legal consequences remain contested.

The thesis also adopts a cautious approach to soft law. Instruments such as the Stockholm and Rio Declarations, the 2030 Agenda and the 2024 Declaration on Future Generations are legally significant without necessarily being binding in the same manner as treaties. Their relevance may lie in interpretation, institutional practice, evidence of normative development, or the articulation of standards that later influence treaty implementation and judicial reasoning. The analysis therefore avoids the binary assumption that a non-binding instrument is either legally irrelevant or equivalent to a binding rule.

1.5 Literature Review

The scholarship on intergenerational equity in international environmental law has, over the past four decades, moved from the margins of legal theory towards the centre of an increasingly urgent debate. The point of departure for almost any serious engagement with this literature remains the

work of Edith Brown Weiss, whose monograph *In Fairness to Future Generations* set out the first comprehensive legal account of duties owed across generations.[9] Weiss advanced the concept of planetary trust: each generation receives the Earth's natural and cultural resources as a beneficiary and must pass them on in no worse condition than it found them. From this she derived three core obligations — the conservation of options, the conservation of quality, and the conservation of access — which she presented not merely as moral aspirations but as principles capable of crystallising into binding norms of international law.[10] What gave the framework its legal ambition was the claim that these obligations could, in principle, generate enforceable rights held by future generations as a class, exercisable against present-generation actors including States themselves.[11] This thesis takes Weiss's tripartite framework as its primary theoretical foundation, whilst acknowledging that the three decades since its publication have exposed a significant distance between the promise of planetary trust and its realisation within the institutional architecture of international law.

Philosophy has contributed its own complications. Rawls's just savings principle offers a recognisable analogue: the idea that each generation holds something in trust for the next, and that justice has a temporal dimension that extends beyond the interests of currently living persons. Legal scholars have drawn on this to argue for obligations of environmental stewardship owed to posterity.[12] The more disruptive contribution, however, is Parfit's analysis of the non-identity problem, which exposes a structural difficulty in grounding obligations to future generations in the language of individual harm. Parfit's argument is that the very identity of future persons is contingent on present choices: a different energy or industrial policy would result not in the same future people living better lives, but in entirely different people existing at all.[13] The implication is that no specific future individual can coherently claim to have been harmed by present environmental degradation, since that individual would not exist but for the choices in question.[14] The legal literature has generally responded by recasting intergenerational obligations in collective terms — grounding them in the interests of future generations as a class rather than in the rights

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[9]Edith Brown Weiss, *In Fairness to Future Generations: International Law, Common Patrimony, and Intergenerational Equity* (Transnational Publishers 1989) 17–45.
[10]ibid 25–38.
[11]ibid 45.
[12]John Rawls, *A Theory of Justice* (revised edn, Harvard University Press 1999) 251–258.
[13]Derek Parfit, *Reasons and Persons* (Oxford University Press 1984) 351–379.
[14]ibid 355–361.

of identifiable individuals. This is a defensible move, and this thesis adopts it. But the move does not dissolve the standing problem; it relocates it. If future generations are a collective legal interest rather than individual rights-holders, the question becomes who can represent that interest before a court or tribunal. That question, it turns out, is the hardest one in the field.

Raz's interest theory offers a way through part of this difficulty. On Raz's account, the existence of a right does not presuppose the present existence of the right-holder; what matters is whether there is a sufficiently weighty interest that grounds a duty in others. Applied to future generations, the argument is that interests in inheriting a habitable planet, functioning ecosystems, and access to clean water are sufficiently determinate to ground present-generation obligations, even though the persons who will hold those interests do not yet exist.[15] Legal scholars have drawn on this framework to argue that the collective interests of future generations in a functioning climate system, biological diversity, and access to clean water are sufficiently determinate to ground present-generation obligations in positive international law. Sand's work has extended this analysis to the procedural dimension, examining the role of transparency and access to environmental information as mechanisms of intergenerational accountability. [16] These contributions suggest that the conceptual obstacles to recognising future generations within international law are not insuperable: the difficulty lies not in the idea itself but in the design of institutions capable of giving it effect.

At the level of positive international law, the interests of future generations have been invoked with growing frequency since the early 1970s, though the legal content of those references has rarely been made explicit. The Stockholm Declaration of 1972 recognised the responsibility of States to protect the natural environment for the benefit of present and future generations, and the Rio Declaration of 1992 embedded the principle of intergenerational equity within the broader concept of sustainable development. [17] The UNFCCC and the Paris Agreement both affirm intergenerational equity in their preambles, though neither instrument specifies the obligations that

[15]Joseph Raz, *The Morality of Freedom* (Oxford University Press 1986) 165–192.
[16]Peter H Sand, 'Sovereignty Bounded: Public Trusteeship for Common Pool Resources?' (2004) 4(1) Global Environmental Politics 47, 52–56.
[17]Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration) (adopted 16 June 1972) UN Doc A/CONF.48/14/Rev.1, principles 1–2; Declaration of the United Nations Conference on Environment and Development (Rio Declaration) (adopted 14 June 1992) UN Doc A/CONF.151/26/Rev 1, principle 3.

flow from this commitment or provides mechanisms through which future generations might seek to vindicate their interests.[18] Weiss has observed that the particular characteristics of climate change — its global scale, its long latency, and its irreversible consequences — render the gap between intergenerational aspiration and legal obligation especially acute, and make a reconceptualisation of what enforceable climate duties might look like both intellectually necessary and practically urgent.[19]

The enforceability of intergenerational obligations, and the connected questions of procedural standing and institutional representation, have attracted sustained attention in the more recent literature. Bustami has provided one of the most rigorous analyses of whether existing international environmental law institutions are equipped to give effect to the interests of future generations, concluding that the absence of recognised standing, the lack of dedicated representational mechanisms, and the fragmentation of international environmental governance collectively prevent intergenerational equity from operating as a genuinely justiciable norm.[20] Gallarati has brought these concerns to bear on the specific context of climate litigation, examining whether courts and tribunals can and should give weight to the long-term interests of future generations when adjudicating claims arising out of States' failures to mitigate greenhouse gas emissions.[21] Lawrence and Köhler's normative account of representation in international climate litigation argues that tribunals can coherently be understood as representing the interests of future generations when States bring claims on their behalf, while also acknowledging the limits of this form of indirect representation and the structural deficiencies that Bustami identifies.[22] Behrendt's work on legal obligations towards future generations in domestic and international settings adds a further dimension, illuminating the conceptual parallels and divergences between constitutional

[18]United Nations Framework Convention on Climate Change (adopted 9 May 1992, entered into force 21 March 1994) 1771 UNTS 107, preamble; Paris Agreement (adopted 12 December 2015, entered into force 4 November 2016) 3156 UNTS 79, preamble.

[19]Edith Brown Weiss, 'Climate Change, Intergenerational Equity, and International Law' (2008) 9(3) Vermont Journal of Environmental Law 615, 617–621.

[20]Ammar Bustami, *The Legal Relationship between Present and Future Generations: An Intertemporal Perspective on Intergenerational Equity* (Springer 2026) 204–219.

[21]F Gallarati, 'Intergenerational Justice from Theory to Practice: The Rights of Future (and Present) Generations in Climate Litigation' (2024) 2 Italian Papers on Federalism 56, 63–71.

[22]Peter Lawrence and Lars Köhler, 'Representation of Future Generations through International Climate Litigation: A Normative Framework' (2018) 60 German Yearbook of International Law 639, 645–650.

frameworks that have begun to recognise future generations and the equivalent discourse in international environmental law.[23]

The literature has developed a strong account of the philosophical and doctrinal foundations of intergenerational equity. It has also identified the main institutional difficulties, including standing, representation, fragmented governance, and weak compliance procedures. The debate is therefore not starting from an absence of proposals. The less settled question is how the different theoretical, doctrinal, and institutional elements should be brought together within a workable legal framework. Several authors have proposed procedural or institutional responses, but these proposals are often examined separately from the legal basis of the obligations they are intended to enforce. Bustami's analysis, for example, shows how far the institutional debate has developed while leaving room for a more integrated assessment of how different reforms might work together.[24] A similar separation appears between philosophical and legal writing, particularly in relation to the non-identity problem and its practical implications for rights, standing, and representation.[25] The non-identity problem is directly relevant to arguments based on individual harm, yet it is not always connected to the institutional question of how collective future interests might be represented.[26] Existing scholarship therefore provides many of the necessary parts of the analysis, but less often tests them within a single framework that moves from normative justification to binding obligation, and from obligation to enforcement and representation.[27]

This thesis makes three related contributions. First, it evaluates existing rules through the criteria of binding force, precision, enforceability, and representation, while keeping the distinction between obligations of conduct and obligations of result clear. Second, it uses Raz's interest-based account and the trusteeship model together: the first explains why future interests can ground present duties, while the second helps identify possible forms of representation. Third, it assesses what the 2024 ITLOS and 2025 ICJ advisory opinions have changed and what they have not,

[23]Svenja Behrendt, 'Facing the Future: Conceiving Legal Obligations Towards Future Generations' (2024) 12 Politics and Governance art 7839, 3–6.
[24]Bustami (n 20) 262–267.
[25]Gallarati (n 21) 72–78.
[26]Parfit (n 13) 355; Rawls (n 12) 257–258.
[27]Weiss (n 9) 45–65; Sand (n 16) 52–56; Lawrence and Köhler (n 22) 650–655.

before considering reforms such as intergenerational impact assessment, institutional representation, and stronger compliance procedures.[28]

[28]Weiss (n 19) 619–621; Bustami (n 20) 268–271; Gallarati (n 21) 78–82.

Chapter 2: Theoretical Foundations: Intergenerational Equity

The question of what international law owes to future generations cannot be addressed without first asking whether law can owe anything to persons who do not yet exist. That is not a rhetorical question; it is a genuine legal difficulty, and this chapter takes it seriously. The analysis moves from the philosophical origins of intergenerational equity — and the foundational contribution of Weiss — through the operationalisation of that concept in treaty law via the vehicle of sustainable development, to the harder problem of legal status and procedural representation. The chapter does not resolve all these difficulties; its purpose is to establish a working framework that the doctrinal analysis in Chapters 3 and 4 can test.

2.1 The Concept of Intergenerational Equity

2.1.1 Origins and Intellectual Background

The notion that current generations owe obligations to those who will come after them is not a creation of modern environmental law. Its roots go deep into moral and political philosophy. In *A Theory of Justice*, Rawls developed the just savings principle, under which each generation bears an obligation to preserve the gains of culture and civilisation and to maintain just institutions for those who come after — a formulation premised on the recognition that justice has a temporal dimension that extends beyond the interests of those who happen to be alive at any given moment.[29] Burke expressed a related thought when he described society as a partnership between those who are alive, those who are dead, and those who will be born[30] — a formulation that captures the essence of intergenerational responsibility, even if it was not expressed in legal terms. Weiss developed the concept of planetary trust, under which humanity holds the Earth not as outright owner but as a fiduciary,[31] arguing that each generation owes it to future generations to preserve the diversity, quality, and availability of natural resources. She maintained that future generations have legally relevant interests, not just moral claims, and that the current generation

[29]John Rawls, *A Theory of Justice* (revised edn, Harvard University Press 1999) 251–258.
[30]Edmund Burke, *Reflections on the Revolution in France* (1790), cited in Richard H Dees, 'A Partnership for the Ages' (2023) 104(1) Pacific Philosophical Quarterly 195, 195.
[31]Edith Brown Weiss, *In Fairness to Future Generations: International Law, Common Patrimony, and Intergenerational Equity* (Transnational Publishers 1989) 17–25.

must pass the planet on 'in no worse condition than received.'[32] The three principles at the centre of her framework concern intergenerational equity: conservation of options, conservation of quality, and conservation of access, all of which aim to ensure that future generations can continue to meet their own needs and values. In the context of climate change, Weiss argued that States have an obligation to prevent rapid environmental degradation, minimise climate-related harm, and preserve future societies' adaptive capacity, especially given the unequal burdens that climate change places on vulnerable populations and developing countries.

2.1.2 Edith Brown Weiss and the Planetary Trust Doctrine

Weiss built her theory on three interconnected principles of intergenerational equity. The first is the principle of conservation of options, which requires each generation to conserve the diversity of the natural and cultural resource base so that future generations are not unduly restricted in their ability to satisfy their own values and needs.[33] The second is the principle of conservation of quality, which requires each generation to maintain the quality of the planet so that it is passed on in no worse condition than it was received.[34] The third is the principle of conservation of access, which requires each generation to provide its members with equitable rights of access to the legacy of past generations and to conserve such access for future generations.[35] These principles view intergenerational equity as a responsibility to prevent current actions from depriving future generations of comparable options, environmental quality, and access to the Earth's natural and cultural resources. Weiss referred to these three principles as a system of 'planetary rights and obligations.'[36] Each generation, she argued, has rights against previous generations — the right to receive the planet in no worse condition than they did — and obligations to those who come after, namely the duty to pass it on in no worse condition. This bilateral structure, each generation both inheriting and transmitting, gives the framework a recognisably legal character.

There is a difficulty, however. The logic is vertical rather than horizontal: it runs between successive generations rather than between co-existing sovereign States, and so sits uncomfortably within the classical architecture of international law, which is premised on relationships of

[32]Weiss (n 3) 37–38.
[33]Weiss (n 3) 38–39.
[34]Weiss (n 3) 40.
[35]Weiss (n 3) 45.
[36]Weiss (n 3) 45.

reciprocity between simultaneously existing sovereign actors. This structural tension is one of the central difficulties examined in Section 2.3, and it helps to explain why translating intergenerational equity into enforceable legal obligations has proven so elusive in practice.

2.1.3 Intergenerational Equity in International Legal Instruments

Following Weiss' initial formulation, the concept of intergenerational equity was quickly integrated into international legal instruments. The 1972 Stockholm Declaration, which predates Weiss' monograph, articulated a related idea in Principle 1, proclaiming that humanity bears 'a solemn responsibility to protect and improve the environment for present and future generations.'[37] This language was groundbreaking at the time, as it was the first time a major international instrument explicitly recognised future generations as beneficiaries of environmental protection. The Rio Declaration of 1992 went even further, incorporating intergenerational equity into Principle 3 — 'the right to development must be fulfilled so as to equitably meet the developmental and environmental needs of present and future generations' [38] — as well as the concept of sustainable development, which is discussed in depth in Section 2.2. The UN Framework Convention on Climate Change, adopted the same year, begins by recognising the need 'to protect the climate system for the benefit of present and future generations of humankind.' [39] The Convention on Biological Diversity also commits parties to preserving biological diversity 'for the benefit of present and future generations.'[40] The 2015 Paris Agreement expressly acknowledges intergenerational equity in its preamble, which provides that Parties should, when taking action to address climate change, respect and consider their respective obligations on human rights, together with gender equality, the empowerment of women, and intergenerational equity. This express reference does not, however, create an autonomous enforceable right or obligation: it functions as part of the interpretive context within which the Agreement's operative provisions, including its long-term temperature goals and successive NDC commitments, must be read. The preamble also recognises 'the importance of ensuring the integrity of all ecosystems, including oceans, and the

[37]Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration) (16 June 1972) principle 1.

[38]Declaration of the United Nations Conference on Environment and Development (Rio Declaration) (14 June 1992) principle 3.

[39]United Nations Framework Convention on Climate Change (opened for signature 4 June 1992, entered into force 21 March 1994) 1771 UNTS 107.

[40]Convention on Biological Diversity (opened for signature 5 June 1992, entered into force 29 December 1993) 1760 UNTS 79, preamble.

protection of biodiversity, recognised by some cultures as Mother Earth, and noting the importance for some of the concept of "climate justice."'[41] This language, while cautious, reflects a growing convergence between intergenerational equity and the broader discourse of climate justice.

2.1.4 The Legal Status of Intergenerational Equity

The legal status of intergenerational equity remains genuinely contested, and this thesis does not attempt to resolve that debate. What is at stake is whether the concept can generate binding obligations and engage State responsibility, or whether it works mainly as an interpretive orientation that shapes how other rules are read.[42] Some scholars argue that intergenerational equity has gradually evolved into a customary norm or general principle, particularly in international environmental law and climate litigation, whereas others maintain that it remains too ambiguous and aspirational to produce independently enforceable obligations.[43] The view this thesis adopts, following the prevailing position in the scholarship, is that intergenerational equity has not yet crystallised into a rule of customary international law in the strict sense: State practice remains too fragmented and *opinio juris* too ambiguous.[44] Although the concept appears increasingly in international environmental instruments, judicial reasoning, and climate litigation, many scholars argue that its normative status is still evolving rather than fully consolidated as a universally binding customary rule.

That does not mean intergenerational equity is legally irrelevant. The better characterisation, it is argued here, is that it functions as a legally significant interpretive principle — capable of shaping the content and scope of obligations derived from treaty or custom — without itself constituting an independent source of binding rules. References to future generations are becoming more common in environmental treaties, constitutional jurisprudence, and climate litigation, but States rarely make an explicit, binding commitment to future generations as such. As one commentator puts it, legal obligations to future generations are still 'often rejected from the outset if there is no

[41]Paris Agreement (opened for signature 22 April 2016, entered into force 4 November 2016) 3156 UNTS 79, preamble.
[42]Ammar Bustami, 'Legal Nature of Intergenerational Equity: Normative Capacity and Legal Status' in Ammar Bustami, *The Legal Relationship between Present and Future Generations: An Intertemporal Perspective on Intergenerational Equity* (Springer 2026) 179.
[43]ibid 218–19.
[44]ibid 204–05.

explicit acknowledgement or established doctrine.'[45] However, as the ICJ observed in the *Gabčíkovo-Nagymaros* Project case, sustainable development — the concept through which intergenerational equity is most commonly operationalised in international environmental law — functions primarily as a principle to be 'taken into account' in the interpretation and application of existing legal obligations, rather than an autonomous source of binding obligations in itself.[46] The Court emphasised that environmental protection and economic development must be reconciled within the framework of treaty performance, giving sustainable development significant interpretive authority while not explicitly recognising it as an independent rule of customary international law.

2.2 Sustainable Development as a Bridge Principle

2.2.1 The Emergence of Sustainable Development

The concept that has carried most of the weight of intergenerational equity in positive international law is sustainable development. The modern formulation of the concept was rooted in the report of the World Commission on Environment and Development, *Our Common Future* (1987), which famously defined sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs.'[47] This formula brings the basic logic of intergenerational equity into the very idea of development. While current generations may have a legitimate right to seek economic and social development, they do so under a responsibility to preserve the ecological and resource foundations on which future generations depend. The Brundtland formulation is not, it has to be said, a precise legal standard. Its vagueness has attracted sustained criticism, and it offers little guidance on how to resolve conflicts between present developmental needs and the interests of future generations. That vagueness may, however, have been a condition of its success. The formula worked precisely because it reframed the relationship between development and environmental protection rather than legislating it.

Rather than viewing environmental protection as an obstacle to economic growth, the World Commission on Environment and Development presented sustainability as a requirement for long-

[45]Svenja Behrendt, 'Facing the Future: Conceiving Legal Obligations Towards Future Generations' (2024) 12 Politics and Governance art 7839, 1.
[46]*Gabčíkovo-Nagymaros Project (Hungary/Slovakia)* (Judgment) [1997] ICJ Rep 7, para 140.
[47]World Commission on Environment and Development, *Our Common Future* (Oxford University Press 1987) 43.

term development. The report stressed that 'economic and ecological concerns are not necessarily in opposition'[48] and that 'the Earth's natural resource base must be conserved and enhanced'[49] if development is to be sustainable over time. The Commission also made the idea of intergenerational responsibility more palatable to developing States by embedding environmental protection in the language of development. Many developing States had opposed earlier environmental discourses, which appeared to privilege the interests of industrialised countries and constrain the developmental opportunities of poorer nations. This sensitivity to distributive inequality is apparent in the report's insistence that 'poverty itself is a precondition for environmentally sound development'[50] and that sustainable development requires more equitable international economic arrangements.

2.2.2 Sustainable Development in International Law: Treaty and Soft Law

The Brundtland formulation found its way rapidly into the institutional fabric of international environmental law. The Rio Declaration of 1992 established it as the organising principle of the growing international environmental order, placing it at the centre of the interaction between the environment and development.[51] Agenda 21, the non-binding action programme endorsed alongside the Rio Declaration, gave a detailed — albeit aspirational — road map for its execution in almost every field of human activity.[52] The Johannesburg Declaration from the 2002 World Summit on Sustainable Development and the outcome declaration of the 2012 United Nations Conference on Sustainable Development, The Future We Want, reiterated the critical role of sustainable development in international environmental governance. In the Johannesburg Declaration, States explicitly 'reaffirm[ed] [their] commitment to sustainable development' and recognised the need to strengthen 'the interdependent and mutually reinforcing pillars of sustainable development — economic development, social development, and environmental protection.'[53] The Declaration emphasised poverty reduction, environmental protection, and

[48]World Commission on Environment and Development, *Our Common Future* (Oxford University Press 1987) 69.
[49]World Commission on Environment and Development, *Our Common Future* (Oxford University Press 1987) 57.
[50]World Commission on Environment and Development, *Our Common Future* (Oxford University Press 1987) 71.
[51]United Nations Conference on Environment and Development, Rio Declaration on Environment and Development (1992) UN Doc A/CONF.151/26 (vol I), principle 1.
[52]United Nations Conference on Environment and Development, Agenda 21 (1992) UN Doc A/CONF.151/26 (vol I) <https://sdgs.un.org/sites/default/files/publications/Agenda21.pdf> accessed 23 May 2026.
[53]World Summit on Sustainable Development, Johannesburg Declaration on Sustainable Development (2002) UN Doc A/CONF.199/20 <https://dhs.mpg.gov.za/The_Johannesburg_Declaration.pdf> accessed 25 May 2026.

natural resource management as 'essential requirements for sustainable development.'[54] More recently, the 2030 Agenda for Sustainable Development and its seventeen Sustainable Development Goals represent the most ambitious attempt to operationalise sustainable development through measurable and time-bound global objectives ranging from poverty eradication to clean energy, climate action, and marine and terrestrial ecosystem protection.

2.2.3 The Legal Status and Content of Sustainable Development

The legal status of sustainable development in international law remains one of the most debated questions in contemporary international environmental scholarship. While the concept appears pervasively in treaty law, soft-law instruments, and judicial reasoning, there is no consensus on whether it has crystallised into a binding rule of customary international law, functions as a general principle of law, or remains primarily an interpretive framework and policy objective. One of the most influential judicial treatments of sustainable development's legal status is found in the ICJ's judgment in the *Gabčíkovo-Nagymaros* Project case (1997), where Judge Weeramantry, in a seminal separate opinion, characterised sustainable development as a 'principle with normative value' that represents a reconciliation between the need for development and the imperative of environmental protection. He described it as part of 'modern international law' reflecting 'a principle…accepted not only in national legal systems but also in many pronouncements by States in international fora.'[55] The majority judgment was more cautious, treating sustainable development as a concept to be balanced rather than a free-standing legal obligation, but acknowledging its growing role in the interpretation of environmental treaty commitments.

More recent jurisprudence has continued to reinforce sustainable development's interpretive role without fully resolving the question of its binding force. The ICJ in *Pulp Mills* on the River Uruguay (2010) confirmed the importance of environmental impact assessment as part of the due diligence expected of States where activities may have significant transboundary environmental effects. This reasoning is consistent with the broader logic of sustainable development, because it requires environmental considerations to be integrated into decision-making before harm occurs.[56]

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[54]ibid.

[55]*Gabčíkovo-Nagymaros Project (Hungary/Slovakia)* (Separate Opinion of Vice-President Weeramantry) [1997] ICJ Rep 7, 88.

[56]*Pulp Mills on the River Uruguay (Argentina v Uruguay)* (Judgment) [2010] ICJ Rep 14, para 204; Pierre-Marie Dupuy and Jorge E Viñuales, *International Environmental Law* (2nd edn, Cambridge University Press 2018) 72–82.

The 2025 ICJ Advisory Opinion on climate change obligations is also relevant to this trajectory, since it treats long-term environmental protection as part of the legal context within which States' climate obligations must be understood and fulfilled. Its detailed significance is examined in Chapter 4.

The content of sustainable development, while contested at its margins, is generally understood to encompass four core elements identified in the landmark *Iron Rhine* arbitration (2005): the principle of intergenerational equity; the concept of sustainable use of natural resources; the principle of equitable use or integration, requiring that environmental considerations be integrated into economic development plans; and the principle of precaution.[57] These elements collectively establish sustainable development not merely as a rhetorical ideal but as a framework that provides concrete orientations for State behaviour, even if the precise legal content of each element remains subject to ongoing elaboration. The relationship between sustainable development and intergenerational equity is symbiotic. Sustainable development provides the operational vehicle through which the abstract principle of intergenerational equity is translated into actionable legal standards, while intergenerational equity supplies the normative foundation that justifies the constraints sustainable development places on present-day economic activity. Together, they form a conceptual architecture that modern international environmental law increasingly deploys to bridge the gap between current regulatory frameworks and the long-term interests of future generations.

It is worth being clear about what this chapter has, and has not, done with sustainable development. The discussion above has treated it primarily as a theoretical and interpretive bridge between intergenerational equity and legal practice — the conceptual vehicle through which an otherwise abstract normative principle has acquired operational content in treaty law and judicial reasoning. That is a distinct function from its role as a positive principle of international environmental law in its own right, and Chapter 3 returns to sustainable development in that second capacity, as one of the operative principles structuring States' substantive obligations alongside the precautionary principle, the no-harm rule, and the due diligence standard.

[57] *Iron Rhine Railway (Belgium v Netherlands)* (Award) PCA, 24 May 2005, paras 58–59; Pierre-Marie Dupuy and Jorge E Viñuales, *International Environmental Law* (2nd edn, Cambridge University Press 2018) 72–82.

A related question is whether intergenerational equity itself, and not only sustainable development, could come to perform the function of an interpretive principle in international environmental law. As Dupuy and Viñuales observe, sustainable development has acquired its interpretive authority partly because it has been explicitly invoked as such by the ICJ and because it operates as an integrating concept capable of reconciling competing legal regimes.[58] Intergenerational equity, by contrast, has so far operated primarily as a normative component within sustainable development rather than as an autonomous interpretive principle. The ICJ's *Gabčíkovo-Nagymaros* judgment and the *Iron Rhine* arbitration both applied sustainable development as the interpretive framework, with intergenerational equity serving as one of its constitutive elements. This structural subordination does not, however, foreclose the possibility that intergenerational equity could itself acquire direct interpretive authority as judicial practice continues to develop — a question examined further in Chapter 3 in light of recent jurisprudence, including the 2025 ICJ Advisory Opinion.

2.3 Rights of Future Generations: Philosophical and Legal Debates

2.3.1 The Core Problem: Can the Unborn Hold Rights?

The foundational difficulty in this area of law is not primarily institutional — it is philosophical. Future persons do not yet exist at the time when decisions affecting them are made. They have no voice in present political processes, no access to current legal systems, and cannot participate in the treaty negotiations and legislative processes that will determine the conditions they inherit. This creates what philosophers refer to as the 'non-identity problem,' first articulated systematically by Derek Parfit, which holds that the very identity of future individuals depends on the choices made by present generations, making it logically problematic to assert that any specific future person has been harmed by those choices since, had different choices been made, different persons would have come into existence.[59]

The non-identity problem has significant implications for the legal recognition of future generations' interests. The orthodox liberal conception of rights holds that rights attach to

[58]Pierre-Marie Dupuy and Jorge E Viñuales, *International Environmental Law* (2nd edn, Cambridge University Press 2018) 72–82.
[59]Derek Parfit, *Reasons and Persons* (Oxford University Press 1984) 351–379.

identifiable subjects who can assert, waive, and enforce those rights. If future persons are not yet identified — and if their very identity is contingent on current decisions — it becomes difficult within this framework to treat them as present right-holders in any legally operative sense. This is not merely a philosophical abstraction; it has concrete implications for questions of standing, causation, and remedy in international legal proceedings. How can a State be required to make reparations to a class of persons who do not yet exist? How can a court identify and give effect to the interests of unborn individuals whose identity and preferences are, by definition, unknown?

A further objection concerns temporal asymmetry. Legal systems generally operate within a present-tense framework in which obligations are owed to identifiable contemporaries. The machinery of treaty law, State responsibility, and dispute resolution was designed to manage relationships between existing States and their current populations. Extending that machinery to cover the interests of generations that will live decades or centuries in the future requires conceptual innovations that existing law has not fully accomplished. As one scholar has observed, international law was 'not designed with the long-term future in mind,'[60] and adapting it to perform that function requires not only doctrinal development but institutional redesign.

The practical legal significance of the non-identity problem is that it forecloses certain avenues of reasoning while leaving others open. It forecloses arguments based on individual harm: if the very existence of a future person depends on present choices, that person cannot coherently claim to have been wronged by those choices, since different choices would have produced a different person. It does not, however, foreclose arguments based on collective interests or objective standards. The move most legal scholars make is to shift the unit of analysis from the individual future person to future generations as a class, and to ask not whether any particular individual has been harmed but whether the conditions required for a minimally decent human life will be available to whoever is born. On this reframing, the non-identity problem loses much of its force: the class of future persons has an interest in inheriting a functioning climate system and intact ecosystems regardless of which particular individuals will constitute that class. The difficulty, as the next section explains, is that this reframing creates its own institutional challenge — it

[60]Peter H Sand, 'Sovereignty Bounded: Public Trusteeship for Common Pool Resources?' (2004) 4(1) Global Environmental Politics 47.

identifies future generations as the relevant legal beneficiary without supplying a mechanism through which their interests can be procedurally represented.

2.3.2 Responses and Alternative Frameworks

Three main responses have emerged in the scholarship. None is entirely satisfactory on its own, but together they give enough analytical purchase for a working legal framework. This thesis draws mainly on the interest-based and trusteeship models as complementary lenses, since both translate fairly readily into the language of State obligations and institutional design that structures the analysis in Chapters 3 and 4. Even so, grounding obligations in collective future interests does not by itself resolve the institutional problem of procedural representation. Defining future generations as a collective legal class tells us who the beneficiaries are; it does not tell us who can assert their interests before the ICJ, an international compliance body, or a domestic court. International adjudication remains structurally State-centric: standing is conferred on existing States and, in some contexts, on international organisations, not on indeterminate future collectives.

The theoretical frameworks examined in this section therefore need to be read alongside the institutional design proposals taken up in Chapter 4, section 4.9, which considers structural options — including institutional trustee arrangements, mechanisms analogous to *actio popularis*, and treaty-based standing rules for recognised advocates of future generations — capable of giving these frameworks some operational form.

Weiss's planetary trust doctrine takes the most direct route around the non-identity problem. By framing intergenerational obligations as duties owed to future generations collectively — as a class, not as identifiable individuals — it avoids the question of which specific future person has been harmed. On this view, present generations hold the Earth in trust for their successors, with the obligation running to the class of future persons generally rather than to any identifiable individual. This approach is consistent with legal systems' capacity to recognise class interests and collective beneficiaries, and it has the advantage of grounding obligations in an existing legal concept — the trust — that is well understood in both common law and civil law traditions. For the purposes of this thesis, the trusteeship model is particularly useful because it maps directly onto the institutional question of who may represent future generations' interests in international proceedings and supervisory mechanisms — an issue examined further in Chapters 3 and 4.

The interest-based approach, drawing on Raz, moves from a different starting point. Rights, on this account, are grounded not in the present existence of a rights-holder but in the importance of the interest to be protected. If future persons will have a weighty interest in inheriting a habitable planet — and there seems little reason to doubt they will — then that interest can ground present obligations, even though those persons do not yet exist and cannot themselves assert the interest before any court.[61] On this account, future persons have an interest in inheriting a habitable planet, access to clean water and air, and the ecological foundations of a dignified human life, and that interest is sufficiently important to ground legal duties in the present. This approach has been influential in the development of constitutional rights frameworks that recognise the interests of future generations, including several constitutional and judicial frameworks that refer to environmental protection for present and future generations. For the purposes of this thesis, the interest-based model provides the normative justification for treating future generations as legal beneficiaries whose interests States are obliged to protect, even in the absence of a formal procedural mechanism through which those interests can be directly asserted.

A third response comes from communitarian and relational theories of justice, which ground intergenerational obligations not in the rights of future persons but in the ongoing responsibility of human communities to sustain the conditions of their collective life over time. Obligations to future generations, on this view, derive from membership in a transgenerational community — a 'partnership between the dead, the living, and the unborn,' in Burke's formulation — rather than from the present existence of identifiable beneficiaries. This resonates with a wide range of cultural and religious traditions that emphasise intergenerational stewardship, and it reinforces the normative foundations of international environmental treaty regimes. It is less directly applicable to the doctrinal analysis that follows, but it provides useful supplementary support for an expansive reading of States' duties towards future generations.

These theoretical frameworks have practical implications for international law. The trusteeship model supports the development of institutional arrangements such as Ombudspersons for Future Generations, which have been established in a number of countries and have been proposed at the United Nations level. Interest-based theories support arguments for extending standing in international proceedings to representatives of future generations' interests. Communitarian

[61] Joseph Raz, *The Morality of Freedom* (Oxford University Press 1986) 166–67.

approaches reinforce the normative foundations of international environmental treaty regimes that already express obligations framed in terms of duties to future generations, and they provide a basis for interpreting those obligations expansively in light of the stewardship responsibilities they reflect.

2.3.3 Legal Recognition of Future Generations: Institutional Developments

Despite the philosophical difficulties just discussed, international law has made real, if incomplete, progress in recognising the legal relevance of future generations' interests. Three areas stand out: treaty law, constitutional and domestic law, and institutional innovation. In treaty law, as discussed in Section 2.1.3, multiple soft law instruments and multilateral environmental agreements now expressly reference future generations as beneficiaries of the obligations they impose. While these references are often found in preambles or expressed in aspirational terms, recent international judicial developments have contributed to giving greater legal weight to the intergenerational dimension of climate obligations. In particular, the 2025 ICJ Advisory Opinion gave intergenerational equity a specific interpretive role. The Court characterised intergenerational equity as a manifestation of equity and stated that due regard for the interests of future generations and the long-term implications of State conduct must be taken into account when States formulate and implement measures in fulfilment of applicable treaty and customary obligations.[62] However, the detailed significance of this opinion, and the extent to which it strengthens the legal protection of future generations in practice, is examined in Chapter 4.

In constitutional and domestic law, the interests of future generations have gained increasingly explicit recognition. A growing number of national constitutions include provisions requiring the State to protect the environment for the benefit of current and future generations.[63] The Colombian Supreme Court, in its 2018 *Future Generations* decision (STC4360-2018), recognised the Colombian Amazon as a subject of rights and ordered the State to develop an intergenerational pact to combat deforestation. The decision has not been overturned, although its implementation

[62]International Court of Justice, *Obligations of States in respect of Climate Change* (Advisory Opinion, 23 July 2025), paras 155–157.

[63]See, eg, Constitution of Norway 1814 (as amended), art 112; Constitution of the Republic of South Africa 1996, s 24(b); Basic Law for the Federal Republic of Germany 1949 (as amended), art 20a.

has faced persistent institutional and enforcement difficulties.[64] The Supreme Court of the Netherlands, in the landmark *Urgenda* case (2019), upheld a ruling that the Dutch State had a legal duty under Articles 2 and 8 ECHR to reduce greenhouse gas emissions. *Urgenda* itself remains authoritative; the prominent Dutch climate judgment later set aside on appeal was the 2021 order against Royal Dutch Shell in *Milieudefensie v Royal Dutch Shell plc*.[65] These domestic developments illustrate an emerging judicial and constitutional trend towards taking long-term and intergenerational interests seriously, while also demonstrating that the precise legal form of that protection differs across jurisdictions.

At the institutional level, a number of significant innovations have been introduced or proposed. The UN Secretary-General's 2021 report *Our Common Agenda* called for stronger institutional attention to future generations and proposed a Special Envoy for Future Generations. This agenda was subsequently reflected in the 2024 Pact for the Future and its annex, the Declaration on Future Generations.[66] Domestic models also exist: Wales has a statutory Future Generations Commissioner, Hungary developed an ombudsperson model for future generations, and the Finnish Parliament has long maintained a Committee for the Future. These institutions do not themselves resolve the standing problem in international law, but they provide concrete models for how long-term interests may be represented within present institutions.

The development of intergenerational protections in international law is therefore an unfinished project, but one that is advancing on multiple fronts. The theoretical difficulties are real but not insurmountable; the practical obstacles are significant but increasingly being addressed through doctrinal innovation, judicial creativity, and institutional reform. The extent to which these developments have produced an adequate framework for protecting future generations in the

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[64] *Future Generations v Ministry of the Environment and Others*, Supreme Court of Colombia, STC4360-2018, 5 April 2018. The decision has not been overturned; implementation has, however, faced significant difficulties. See ESCR-Net, 'STC 4360–2018' (case summary, 2019, updated materials available online).

[65] *State of the Netherlands v Urgenda Foundation*, Supreme Court of the Netherlands, 20 December 2019, ECLI:NL:HR:2019:2007. By contrast, the order against Royal Dutch Shell was set aside on appeal: Court of Appeal of The Hague, 12 November 2024, ECLI:NL:GHDHA:2024:2100.

[66] United Nations Secretary-General, *Our Common Agenda: Report of the Secretary-General*, UN Doc A/75/982 (5 August 2021); UNGA Res 79/1, Pact for the Future, UN Doc A/RES/79/1 (22 September 2024), annex II (Declaration on Future Generations); Well-being of Future Generations (Wales) Act 2015 (anaw 2); Committee for the Future, Parliament of Finland (Eduskunta), established 1993.

specific context of climate change — and the reforms that would be needed to make that protection effective — is the central question that the remainder of this thesis addresses.

2.4 Chapter Summary

This chapter has examined the theoretical foundations on which any legal regime for the protection of future generations must rest. The first section traced the intellectual origins of intergenerational equity from political philosophy — particularly the work of Rawls, Burke, and Weiss — through its gradual incorporation into international legal instruments, from the Stockholm Declaration to the Paris Agreement. The central doctrinal tension that emerged is that, while intergenerational equity is now referenced throughout international environmental law, its status as a source of binding obligations remains contested and unresolved. The bilateral logic underlying Weiss' planetary trust doctrine, while useful for legal argument, also sits uneasily within the classical architecture of international law, which is built around reciprocal obligations between co-existing sovereign States.

The second section turned to sustainable development as the main operational vehicle for intergenerational equity in international law, tracing its emergence from the Brundtland Report through its elaboration in the Rio Declaration, Agenda 21, and subsequent global frameworks. Its key legal function, on the account given here, is as an interpretive principle that integrates environmental and developmental considerations — and its consolidation as a norm with genuine legal content, rather than merely aspirational rhetoric, is real but still incomplete.

The third section took on the underlying philosophical challenge of grounding obligations to future persons in law, reviewing the main theoretical frameworks — trusteeship, interest-based, and communitarian — developed to do so without relying on the present existence of identifiable beneficiaries. As noted, this thesis leans on the interest-based and trusteeship models as the frameworks most readily translated into the language of State obligations and institutional design, while also surveying the growing body of domestic constitutional jurisprudence and institutional innovation that reflects a wider recognition of future generations' legally relevant interests.

Together, these three strands establish the theoretical framework that guides the doctrinal and institutional analysis in the chapters that follow. The core claim is that intergenerational equity, operationalised through sustainable development and supported by evolving domestic and

international practice, provides a credible basis for interpreting and strengthening legal obligations concerning the environmental commons. What remains to be seen is whether the current framework of international environmental law gives adequate effect to these obligations, and what reforms might be needed to close the gap that remains — questions taken up in the chapters that follow.

Chapter 3: International Environmental Law Framework

3.1 Key Treaties and Soft Law Instruments

3.1.1 Introduction: The Architecture of International Environmental Law

International environmental law was assembled treaty by treaty and principle by principle in response to accumulating evidence of environmental degradation, rather than designed as a coherent legal order. Its architecture is a dense and sometimes overlapping web of multilateral agreements, customary rules, general principles and non-binding instruments, each addressing particular environmental problems once they had acquired sufficient political salience to demand international cooperation. As Dupuy and Viñuales observe, the result is a degree of fragmentation and institutional pluralism that distinguishes the field from more centralised branches of international law.[67] There is no single global environmental organisation with general regulatory authority, no compulsory dispute-settlement mechanism applicable across regimes, and no hierarchical system for resolving conflicts between competing environmental commitments. Protection for future generations is accordingly not located in a single instrument. It emerges, where it emerges, from the combined effect of legal materials of differing status operating across different regimes.

The question addressed in this chapter is to what extent existing international environmental law translates the normative idea of intergenerational equity, examined in Chapter 2, into concrete legal obligations capable of protecting future generations. Answering it requires attention to the legal status of each source. The chapter distinguishes binding treaty obligations; customary rules; general and interpretive principles; soft-law instruments; preambular references; and political commitments. References to future generations carry different legal weight in each category, and the appearance of the phrase in an international instrument is not treated here as evidence that it creates a legal obligation. For each major instrument, three questions are asked: what its legal status is, what it contributes to the protection of future generations, and what its limitations are from an intergenerational perspective.

[67] Dupuy P-M and Viñuales JE, *International Environmental Law* (2nd edn, Cambridge University Press 2018) 26.

Two analytical threads run through the chapter. The first concerns substantive legal development: whether, and through which doctrines, present legal duties are shaped by long-term environmental interests. The second concerns institutional representation and enforcement: who can invoke those duties, through what procedure and with what remedy, when the interests at stake belong partly to persons not yet born. The argument advanced is that international environmental law has made more progress on the first than on the second. Intergenerational equity operates principally not as an autonomous, directly enforceable rule but through the interpretation and application of established doctrines — prevention, due diligence, precaution, environmental assessment, human rights and sustainable development — and the protection this produces is meaningful but indirect and uneven.

The chapter proceeds from sources to obligations to institutions. Section 3.1 examines the treaty and soft-law architecture. Section 3.2 turns to the customary no-harm rule and its development into a broader duty of prevention, to due diligence as the standard of conduct through which preventive obligations are ordinarily assessed, and to the procedural duties that operationalise that standard. Precaution is considered in Section 3.3, after prevention and due diligence, because its legal status is less settled and because it operates principally under conditions of scientific uncertainty. Section 3.4 addresses human-rights law, and Section 3.5 sustainable development and the question whether intergenerational equity may acquire interpretive authority of its own. Section 3.6 then applies the four criteria set out in Sections 1.2.1 and 1.4 — legal status, precision, monitoring, compliance, responsibility and remedy, and representation — to the framework as a whole, and identifies the question that Chapter 4 takes up.

3.1.2 The Stockholm Declaration (1972)

The Stockholm Declaration is a soft-law instrument. It created no binding obligations, and its importance lies elsewhere: it established the normative vocabulary within which later treaty-making and institutional development took place. Its twenty-six principles articulate, for the first time in a major multilateral forum, the proposition that environmental protection is a matter of international concern rather than a purely domestic prerogative, and that this concern extends across time as well as space. Section 2.1.3 has already noted the wording of Principle 1; the concern here is its legal weight.

Principle 1 proclaims the fundamental right of man to freedom, equality and adequate conditions of life in an environment of a quality that permits a life of dignity and well-being, together with a solemn responsibility to protect and improve the environment for present and future generations.[68] Principle 2 adds that the natural resources of the Earth must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate. These formulations introduced explicit intergenerational responsibility into international environmental discourse at a conference attended by more than a hundred States.

Their legal effect is nonetheless limited. The principles are not directly enforceable before international courts, and States have often treated them as political aspirations. The Declaration's influence has been indirect. Concepts associated with it, notably the responsibility not to cause transboundary environmental harm reflected in Principle 21, have informed the articulation of general international law in judicial practice,[69] and the intergenerational language of Principles 1 and 2 supplied a normative foundation on which later, more specific commitments could build. That language has not itself been converted into a binding obligation, and it identifies no actor entitled to invoke it on behalf of future generations.

3.1.3 The Rio Declaration and Agenda 21 (1992)

The Rio Declaration is also a soft-law instrument. It was adopted at the 1992 Conference on Environment and Development alongside the non-binding programme of action known as Agenda 21 and the two framework conventions on climate change and biological diversity. Section 2.2 traced how the Brundtland formulation of sustainable development reached Rio; the concern here is the operative content of the Rio instruments.

Rio's treatment of intergenerational equity is more developed than Stockholm's. Principle 3 states that the right to development must be fulfilled so as to equitably meet the developmental and environmental needs of present and future generations. The formulation makes two contributions. It situates intergenerational equity within the concept of sustainable development, establishing a relationship between the two that structured later legal developments. And by speaking of needs

[68]Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration) (adopted 16 June 1972) UN Doc A/CONF.48/14/Rev.1, principles 1 and 2.

[69]For an example of soft-law environmental principles informing the development and articulation of general international law, see *Legality of the Threat or Use of Nuclear Weapons* (Advisory Opinion) [1996] ICJ Rep 226, para 29, reflecting the general obligation associated with Stockholm Principle 21 and Rio Principle 2.

rather than rights, it avoids the contested question whether future generations hold legally cognisable rights while still affirming that their interests place constraints on present conduct.[70] Principle 15, which articulates the precautionary approach, is considered in Section 3.3.1, and Principle 7 recognises common but differentiated responsibilities as the framework for allocating environmental burdens between developed and developing States.

Agenda 21 gave practical content to sustainable development across a wide range of sectors, including biodiversity, forests, freshwater and climate change. Its aspirational character limits its direct legal force, but it has served as a reference point for treaty bodies and institutions seeking to operationalise the commitments made at Rio.[71]

From an intergenerational perspective the limitation of the Rio instruments is that of soft law generally. Their contribution lies in consolidating sustainable development as an organising principle of international environmental governance and in supplying the language through which intergenerational concerns entered later treaty regimes. They do not themselves impose obligations calibrated to an intergenerational standard, and they provide no procedure through which the interests of future generations could be asserted.

3.1.4 The UNFCCC: Framework Obligations and Their Limits

The UNFCCC is a binding treaty, but a framework convention in the technical sense. It does not itself impose quantified emission-reduction obligations on individual Parties. It establishes institutions, principles and objectives within which more specific commitments are developed through protocols and decisions of the Conference of the Parties.[72] Its objective, set out in Article 2, is the stabilisation of greenhouse gas concentrations at a level that would prevent dangerous anthropogenic interference with the climate system. The formulation is future-oriented without being operationally specific. What counts as 'dangerous' is to be determined by reference to scientific assessment of climate risks over time, and the harms in question will materialise over decades and longer. The objective cannot be evaluated by reference to present conditions alone,

[70]Declaration of the United Nations Conference on Environment and Development (Rio Declaration) (adopted 14 June 1992) UN Doc A/CONF.151/26 (vol I), annex I, principles 3 and 15.
[71]Agenda 21 (adopted 14 June 1992) UN Doc A/CONF.151/26 (vol I); Dupuy and Viñuales (n 67) 34–38.
[72]United Nations Framework Convention on Climate Change (adopted 9 May 1992, entered into force 21 March 1994) 1771 UNTS 107, arts 2 and 3.

only by reference to projections of what present emissions will cause; in that sense it is inherently intergenerational.

The Convention's preamble expresses the determination to protect the climate system for present and future generations, and Article 3 sets out principles by which the Parties are to be guided in pursuing the objective and implementing the Convention. Article 3(1) provides that the Parties should protect the climate system for the benefit of present and future generations of humankind on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities.[73] This is among the more explicit affirmations of intergenerational equity in a binding multilateral environmental agreement concluded before the Paris Agreement. Its legal weight should nevertheless be assessed with care. It appears in a provision that guides implementation rather than in the operative commitments, it is formulated in hortatory terms, and the Convention does not specify what obligations follow from it for individual States or provide any mechanism through which representatives of future generations could invoke it.

3.1.5 The Kyoto Protocol (1997)

The Kyoto Protocol, adopted in 1997 and in force since 2005 following Russia's ratification, was the first attempt to translate the UNFCCC's framework commitments into quantified, binding obligations. It required the developed country Parties listed in Annex B to reduce their aggregate greenhouse gas emissions by at least five per cent below 1990 levels during the first commitment period of 2008 to 2012.[74] Its compliance mechanism also showed that the climate regime could develop more rigorous accountability arrangements when the political will existed.[75]

The Protocol's limitations as an instrument of intergenerational protection were structural. Quantified commitments applied only to developed country Parties, reflecting the principle of common but differentiated responsibilities;[76] major emitters among developing countries fell outside them, and the United States did not ratify. Commitment periods were short relative to the multigenerational scale of climate change. The obligations depended on the consent of the States

[73]UNFCCC (n 72) preamble and art 3, chapeau and para 1.
[74]Kyoto Protocol to the United Nations Framework Convention on Climate Change (adopted 11 December 1997, entered into force 16 February 2005) 2303 UNTS 162, art 3.
[75]Kyoto Protocol (n 74) arts 5, 7, 8 and 18; Decision 27/CMP.1, 'Procedures and mechanisms relating to compliance under the Kyoto Protocol', UN Doc FCCC/KP/CMP/2005/8/Add.3 (30 March 2006).
[76]Kyoto Protocol (n 74) art 3; UNFCCC (n 72) art 3(1).

concerned. And future generations had no representation in the negotiation or operation of the regime. These features limited the Protocol's environmental effectiveness, and they illustrate on a small scale the difficulties that the rest of this chapter examines.

3.1.6 The Paris Agreement (2015)

The Paris Agreement, in force since November 2016 with near-universal participation, moved away from the top-down, differentiated structure of the Kyoto Protocol towards a bottom-up architecture built on nationally determined contributions. For present purposes its goals must be distinguished from its obligations. Article 2(1)(a) states the aim of holding the increase in global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit it to 1.5°C, recognising that this would significantly reduce the risks and impacts of climate change.[77] These goals are the Agreement's principal long-term benchmark. They are not framed as individual emission targets for each Party.

The operative obligations lie elsewhere. Under Article 4, each Party must prepare, communicate and maintain successive nationally determined contributions and pursue domestic mitigation measures with the aim of achieving their objectives. Each successive contribution is to represent a progression beyond the Party's current one and to reflect its highest possible ambition, and contributions are to be communicated every five years.[78] These are obligations of conduct: they regulate what Parties must do in preparing and pursuing their contributions, not the temperature outcome. The Agreement also establishes procedural arrangements: a transparency framework, a global stocktake of collective progress and a compliance committee. Each is designed to be facilitative, and the committee is expressly expert-based, non-adversarial and non-punitive.[79] None is designed to determine, through an adversarial process, whether an individual Party's contribution is adequate. The 2025 ICJ Advisory Opinion, discussed in Section 4.2, indicates that States' discretion in setting their contributions is not unlimited and that the ambition required is assessed by reference to the Agreement's temperature goals.[80]

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[77]Paris Agreement (adopted 12 December 2015, entered into force 4 November 2016) 3156 UNTS 79, art 2(1)(a).
[78]ibid arts 4(2), 4(3) and 4(9).
[79]ibid arts 13(3), 14(1) and 15(2).
[80]International Court of Justice, *Obligations of States in respect of Climate Change* (Advisory Opinion, 23 July 2025) paras 234–249.

Two further points bear on intergenerational protection. First, the preamble notes the importance, for some, of the concept of 'climate justice' and lists intergenerational equity among the considerations that Parties should respect, promote and consider when taking climate action.[81] As Section 2.1.3 observes, this reference does not create an autonomous obligation; it forms part of the interpretive context in which the operative provisions are read. Second, the intergenerational significance of the temperature goals should be stated with care, and legal propositions should be kept apart from scientific ones. The legal proposition is that the goals furnish the benchmark against which the adequacy of States' conduct is assessed. The related scientific proposition, that risks increase with each increment of warming and that some changes are irreversible over long periods, rests on the assessments of the IPCC and not on the Agreement itself.[82] The goals matter intergenerationally because present emissions shape climatic conditions over decades and longer periods, not because any particular temperature marks an exact boundary beyond which harm becomes catastrophic.

Assessed as an instrument of intergenerational protection, the Agreement therefore combines a long-term benchmark and a set of binding conduct and procedural obligations with self-determined contributions, facilitative review and no mechanism for the representation of future generations. Its protective potential depends substantially on the content given to the due diligence standard by which States' contributions are assessed, discussed in Section 3.2.3.

3.1.7 Other Significant Instruments

Beyond the climate regime, three sets of instruments show how long-term environmental interests are converted into legal or institutional obligations in other fields.

The Convention on Biological Diversity is a binding treaty that commits its Parties to the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising from the utilisation of genetic resources.[83] Its preamble speaks of conserving biological diversity for the benefit of present and future generations, as

[81]Paris Agreement (n 77) preamble.

[82]Intergovernmental Panel on Climate Change, *Climate Change 2023: Synthesis Report*. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC 2023); IPCC, *Global Warming of 1.5°C* (n 5).

[83]Convention on Biological Diversity (opened for signature 5 June 1992, entered into force 29 December 1993) 1760 UNTS 79, arts 1 and 2.

Section 2.1.3 notes, and the definition of sustainable use in Article 2 refers expressly to the needs and aspirations of present and future generations. Its contribution is to build the intergenerational rationale into the definition of the Convention's central operative concept. Its limitations are those of a framework convention: implementation is left largely to national strategies, and the Convention provides no mechanism through which representatives of future generations could challenge a State's biodiversity strategy as inadequate. The irreversibility of species loss gives the intergenerational concern particular force in this field, a point taken up in Section 3.3.3.

UNCLOS is a binding treaty that establishes general obligations of environmental protection. Article 192 obliges States to protect and preserve the marine environment, and Article 194 requires them to take all measures necessary to prevent, reduce and control pollution of the marine environment from any source.[84] These provisions are formulated in general terms and leave the specific measures required to be determined through States' own assessment of their obligations. The 2024 ITLOS Advisory Opinion clarified their application to the climate context. It held that anthropogenic greenhouse gas emissions can constitute pollution of the marine environment within the meaning of the Convention, that the relevant obligations apply alongside those under the UNFCCC and the Paris Agreement, and that the standard of due diligence is informed by the best available science.[85] As an advisory opinion it is not binding, though it carries considerable interpretive authority. Its contribution to intergenerational protection lies in making a general obligation more precise and reviewable; its detailed content is examined in Section 4.3.

The Kunming-Montreal Global Biodiversity Framework, adopted by the Conference of the Parties to the CBD in 2022, sets targets for protected-area coverage and ecosystem restoration to 2030 and a vision of living in harmony with nature by 2050 that is expressed in terms of what future generations will inherit.[86] It is a decision of the Conference of the Parties rather than a treaty. It

[84]United Nations Convention on the Law of the Sea (adopted 10 December 1982, entered into force 16 November 1994) 1833 UNTS 3, arts 192 and 194.

[85]International Tribunal for the Law of the Sea, *Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law* (Advisory Opinion, 21 May 2024) <https://www.itlos.org/fileadmin/itlos/documents/cases/31/Advisory_Opinion/C31_Adv_Op_21.05.2024_orig.pdf > accessed 15 May 2026.

[86]Conference of the Parties to the Convention on Biological Diversity, Decision 15/4, 'Kunming-Montreal Global Biodiversity Framework' (19 December 2022) UN Doc CBD/COP/DEC/15/4, annex, paras 7(n), 10 and 13, targets 2 and 3.

shows how long-term interests can be given institutional expression through time-bound goals, but the translation of its vision into enforceable obligations remains incomplete.

3.1.8 The 2024 Declaration on Future Generations and Contemporary Institutional Practice

The Pact for the Future and its annexed Declaration on Future Generations, adopted by the General Assembly in September 2024, are political and normative instruments rather than treaties.[87] Section 2.3.3 traced their institutional background, in particular the proposal in *Our Common Agenda* for a Special Envoy for Future Generations. The Declaration describes future generations as generations that do not yet exist and recognises that present decisions, actions and inaction have an intergenerational multiplier effect. It is evidence that intergenerational responsibility has moved from the margins of environmental discourse into the mainstream agenda of global governance, but it does not itself transform its commitments into directly enforceable legal duties.

For environmental law, its relevance lies in the procedures it emphasises: a clean, healthy and sustainable environment, science-based decision-making, strategic foresight, anticipatory risk analysis and forward-looking impact assessment. These commitments connect the language of future generations to methods that present institutions can operationalise. They support a procedural understanding of intergenerational equity, under which decision-makers identify long-term effects, use the best available evidence and take those effects into account before policies become locked in or environmental damage becomes irreversible. They also correspond closely to the anticipatory character of prevention, due diligence and environmental assessment examined in Section 3.2.

The Declaration's limitations are correspondingly clear. Its institutional programme depends on implementation by existing national and international bodies. It creates no general cause of action for future generations and establishes no universal representative with authority to challenge harmful State conduct. Its importance is therefore normative, interpretive and institutional rather than jurisdictional. That distinction becomes central when the thesis assesses proposals for intergenerational impact assessment, representation and compliance mechanisms in Section 4.9.

[87] UNGA Res 79/1, Pact for the Future (n 66) annex II (Declaration on Future Generations).

3.2 State Obligations Toward Future Generations

3.2.1 The Structure of Environmental Obligations

International environmental law produces obligations of different legal characters, and the differences determine how the law can, and where it cannot, protect future generations. Drawing on the International Law Commission's work on the prevention of transboundary harm and on the analysis of Dupuy and Viñuales, three categories are distinguished: obligations of conduct, obligations of result and due diligence obligations. The distinction was identified in Section 1.4 as a methodological premise of the thesis, and this section develops its doctrinal content.

Obligations of conduct require a State to take specified actions or refrain from specified conduct, irrespective of whether the conduct actually produces the environmental outcome it is designed to achieve. The obligation to submit national reports under multilateral environmental agreements is an example: a State discharges it by submitting a conforming report, and whether the reported policies are environmentally effective is a separate matter. Many procedural obligations in international environmental law, such as the obligations to conduct environmental impact assessments, to notify neighbouring States of potentially harmful activities and to consult in good faith, fall into this category.

Obligations of result require States to achieve a defined outcome and leave them discretion as to the means. In the climate regime the clearest example is the quantified commitment in Article 3 of the Kyoto Protocol (Section 3.1.5). The temperature goals in Article 2 of the Paris Agreement, by contrast, are not properly characterised as an individual obligation of result owed by each State. They operate as a collective benchmark against which the adequacy of each State's conduct is assessed, which is also how the ICJ approached them in its 2025 Opinion, as Section 1.1 records. Individual States remain bound by obligations of conduct, chiefly due diligence and the preparation, communication, maintenance, progression and implementation of nationally determined contributions calibrated to what the best available science indicates is required to achieve the collective objective. That the temperature goals require a level of aggregate ambition which the current system of contributions has not yet produced does not convert Article 2 into a guarantee, owed by any single State, that a particular temperature outcome will be achieved.

Due diligence obligations form a distinct group within the broader category of obligations of conduct. They require States to take all necessary measures, defined by reference to a standard of conduct rather than a guaranteed outcome, to prevent specified harms. A State satisfies the obligation if it takes the measures required by the applicable standard, even if they prove insufficient to prevent the harm, since the obligation is to prevent foreseeable harm through appropriate effort and not to guarantee its absence. The point matters in the climate context, where the connection between individual States' emissions and specific impacts is mediated by atmospheric processes and global economic activity, so that attributing specific harms to specific States is inherently complex.[88]

The three categories relate to the rest of the section as follows. Prevention identifies what States must seek to avert. Due diligence supplies the standard of conduct by which compliance with the preventive obligation is assessed. Environmental impact assessment, notification, consultation, regulation and cooperation are the procedural and regulatory means through which the standard is operationalised. Sections 3.2.2 to 3.2.4 follow that sequence.

3.2.2 The No-Harm Rule and the Duty of Prevention

The no-harm rule is one of the most firmly established customary rules of international environmental law. In its classical form it requires States to ensure that activities within their jurisdiction or control do not cause significant environmental harm to other States or to areas beyond national jurisdiction. Its historical development is commonly traced through *Trail Smelter*, the ICJ's statement in the *Nuclear Weapons* Advisory Opinion that States must ensure that activities within their jurisdiction and control respect the environment of other States and of areas beyond national control, and the Court's later prevention jurisprudence, notably *Pulp Mills*. The 2025 Climate Change Advisory Opinion further confirmed the relevance of the customary obligation to prevent significant environmental harm to the climate system and treated due diligence as the applicable standard of conduct.[89]

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[88] International Law Commission, 'Draft articles on Prevention of Transboundary Harm from Hazardous Activities, with commentaries' (2001) UN Doc A/56/10, art 3 and commentary; *Responsibilities and Obligations of States with Respect to Activities in the Area* (Advisory Opinion) [2011] ITLOS Rep 10; Dupuy and Viñuales (n 67) 200–202.

[89] *Trail Smelter Case (United States v Canada)* (1941) 3 RIAA 1905; *Nuclear Weapons* (n 69) para 29; *Pulp Mills on the River Uruguay (Argentina v Uruguay)* (Judgment) [2010] ICJ Rep 14, paras 101 and 197–204; ICJ, Climate Change Advisory Opinion (n 80) paras 272–300.

The legal evolution has been from a predominantly bilateral no-harm formulation towards a preventive obligation capable of addressing risks to environmental systems whose protection has a collective dimension. Where there is a risk of significant environmental harm, States must take appropriate preventive measures before the harm materialises. The legal relevance of prevention need not depend on identifying a single presently injured State; it can operate in relation to shared environmental systems whose degradation threatens the international community and future populations.[90]

This development matters for intergenerational protection, but its scope should not be overstated. A purely bilateral model, centred on an identifiable injured State and completed harm, fits poorly with climate change and other long-latency problems. A preventive formulation is better suited to harms that develop cumulatively over decades, because it asks whether present States have taken the measures required by the risk before irreversible consequences are fully realised. It does not create rights for persons not yet born, or direct legal personality for future generations. It allows their long-term interests to influence the content and timing of duties owed by States today without requiring them to possess such personality.

The duty of prevention is not an obligation to guarantee that no environmental harm will occur. Its content is mediated through due diligence: the State must deploy the measures reasonably required in light of the seriousness and foreseeability of the risk, the available scientific knowledge, its capacity to regulate relevant public and private actors and the applicable legal framework, and the more severe or irreversible the threatened harm, the more demanding the expected standard of care may become.[91] Prevention and due diligence can therefore establish primary obligations before damage occurs. Contentious enforcement, however, still depends on jurisdiction, admissibility, proof of breach and, where compensation is sought, causation and injury. The absence of direct standing for future generations remains an institutional problem even though the substantive duty is not confined to completed bilateral injury. Chapter 4 returns to these limits, in particular in Sections 4.6 and 4.8.

[90]On the preventive character of the obligation, see *Pulp Mills* (n 89) paras 101, 197 and 204; Dupuy and Viñuales (n 67) 60–82.
[91]Dupuy and Viñuales (n 67) 183.

3.2.3 Due Diligence as the Standard of Prevention

Prevention identifies the primary obligation to avert significant environmental harm; due diligence supplies the standard of conduct by which compliance is assessed. It is not a guarantee of environmental result. A breach turns on whether the State used the measures reasonably available to it in light of the foreseeability and seriousness of the risk, the state of scientific knowledge, its regulatory capacity, the proportionality of the measures required and the potential irreversibility of the threatened harm. This structure matters for future generations for two reasons. It permits legal scrutiny of present conduct before long-term damage has fully materialised, and the standard tightens as the threatened harm becomes more serious and less reversible.

The ICJ's judgment in *Pulp Mills* (2010) is the leading elaboration of the standard in the environmental context. The Court confirmed that States are under an obligation to use all the means at their disposal to avoid activities in their territory causing significant damage to the environment of another State.[92] It also confirmed the obligation to conduct an environmental impact assessment before authorising activities likely to cause significant transboundary harm, which it treated as a requirement of general international law (Section 3.2.4).

The 2024 ITLOS Advisory Opinion applied the standard to greenhouse gas emissions. The Tribunal confirmed that States have due diligence obligations under UNCLOS to prevent, reduce and control marine pollution from such emissions, and that the applicable standard requires measures consistent with the best available science, including the assessments of the IPCC.[93]

The 2025 ICJ Advisory Opinion gave the most authoritative judicial statement to date on the content of States' due diligence obligations in the climate context. The Court indicated that the standard requires States to take all necessary measures to prevent, reduce and control greenhouse gas emissions, guided by the best available science, and that it is to be evaluated by reference to the long-term temperature goals of the Paris Agreement and not merely the procedural requirements of the contributions system.[94] The Opinion is examined in Sections 4.2 and 4.5. Two points bear on intergenerational protection here. First, reliance on the best available science makes the standard responsive to what is known about long-term consequences. Second, the diffuse

[92] *Pulp Mills* (n 89) paras 101 and 204.
[93] ITLOS, Climate Change Advisory Opinion (n 85) para 232.
[94] ICJ, Climate Change Advisory Opinion (n 80) paras 234–254 and 280–300.

causation of climate change does not by itself dissolve responsibility, since a due diligence standard is assessed against each State's own conduct and capacities;[95] how the Court addressed causation and responsibility is considered in Section 4.6.

3.2.4 Environmental Impact Assessment, Notification and Consultation

Environmental impact assessment is one of the clearest procedural means of converting prevention into decision-making practice. Where activities pose a risk of significant transboundary environmental harm, general international law requires the State to assess their foreseeable effects before authorising them (Section 3.2.3). The 2025 Opinion addressed environmental impact assessment in the climate context, which reinforces that requirement.[96]

What existing law requires and what an intergenerationally sensitive assessment might involve should be kept apart. Existing law requires assessment of foreseeable significant transboundary effects. On the authorities examined in this thesis it does not require a distinct 'intergenerational impact assessment'. The temporal dimension can nevertheless be read into the existing duty. An assessment confined to immediate local effects may overlook cumulative emissions, long-lived infrastructure and lock-in effects, and impacts that materialise over decades. An intergenerationally sensitive assessment would therefore consider not only whether harm is foreseeable but also when it is likely to occur, how long it may persist, whether it is irreversible and whether future decision-makers will retain realistic options to avoid or remedy it. That is an interpretation of the duty's purpose and a proposal for its development, not a statement of settled law; Section 4.9 considers whether a distinct requirement should be introduced.

Notification and consultation complement assessment because environmental risk cannot always be managed unilaterally. Climate change is the paradigmatic cumulative problem: no single source explains the global harm, yet aggregate conduct produces serious consequences. The duty to cooperate therefore performs a structural role alongside prevention. It requires States to participate in good faith in collective arrangements and makes the adequacy of purely domestic action legally relevant within a wider international framework.

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[95] ICJ, Climate Change Advisory Opinion (n 80) para 276 (a risk of significant harm may arise from the cumulative effect of the acts of several States even where it is difficult to identify a specific share of responsibility of any particular State).

[96] ICJ, Climate Change Advisory Opinion (n 80).

The 2025 ICJ Advisory Opinion identifies prevention of significant environmental harm and cooperation as central customary obligations and treats due diligence as the standard governing conduct.[97] Taken together, these procedural elements shift legal attention from compensation after harm to the quality of decisions taken before harm becomes entrenched, which is where they are most relevant to future generations. They regulate present conduct in a way that protects long-term interests, but, like prevention and due diligence, they are invoked by and against present States.

3.3 The Precautionary Principle and Its Role in Protecting Future Interests

3.3.1 Origins and Formulation

The precautionary principle responds to the fact that environmental harms are frequently characterised by uncertainty, irreversibility and long latency. By the time scientific evidence establishes causation to the standard that traditional legal proof requires, the opportunity to prevent the harm may have passed. The principle authorises, and in some formulations requires, preventive action before harm materialises even in the absence of full scientific certainty. Its earliest articulations appeared in domestic law, particularly German environmental law in the 1970s, before migrating into international instruments in the 1980s. The Bergen Ministerial Declaration of 1990 offered one of the first clear international formulations, and Principle 15 of the Rio Declaration, which is broadly similar, has become the canonical reference point: where there are threats of serious or irreversible damage, lack of full scientific certainty is not to be used as a reason for postponing cost-effective measures to prevent environmental degradation.[98]

The Rio formulation contains two qualifications that have structured later debate. The threshold of application is the threat of serious or irreversible damage, which excludes minor or readily reversible harm. And the measures required are described as cost-effective, so that precaution is calibrated against the economic costs of action. Both are contested, since critics argue that they

[97]ICJ, Climate Change Advisory Opinion (n 80) paras 132–142 and 272–300.

[98]Ministerial Declaration on Sustainable Development in the ECE Region (Bergen, 16 May 1990), para 7; Rio Declaration (n 70) principle 15. On the principle's European and German origins, see Nicolas de Sadeleer, *Environmental Principles: From Political Slogans to Legal Rules* (Oxford University Press 2002) ch 3.

permit States to invoke uncertainty and cost as reasons for inaction in precisely the situations in which the principle is most needed. Their consequences are considered in Section 3.3.4.

3.3.2 Legal Status of the Precautionary Principle

The legal status of the precautionary principle has been the subject of extensive scholarly and judicial controversy. Positions range from the view that it has crystallised into a rule of customary international law, through the more modest view that it is a general principle of law, to the more cautious view that it operates as an interpretive approach shaping how existing treaty and customary obligations are applied without itself generating new ones. Dupuy and Viñuales take a careful position: the principle appears in a large number of instruments and has been invoked by many courts and tribunals, but the evidence of consistent and uniform State practice necessary to establish a customary rule remains incomplete.[99]

The ICJ has not pronounced definitively on whether the principle has attained customary status, treating it instead as a consideration relevant to the interpretation of treaty obligations. In the *Southern Bluefin Tuna* and *MOX Plant* cases, ITLOS prescribed provisional measures on the basis of reasoning framed in terms of prudence and caution, without resolving the question of customary status. The Seabed Disputes Chamber of ITLOS went further in its 2011 Advisory Opinion, describing the precautionary approach as an integral part of the general obligation of due diligence and noting a trend towards its recognition as part of customary international law.[100] The 2024 ITLOS Advisory Opinion likewise applied the precautionary approach to marine pollution from greenhouse gas emissions, describing it as all the more necessary given the serious and irreversible damage that such pollution may cause.[101] These authorities show a consistent pattern: precaution appears as a factor informing the interpretation and application of other obligations and not as an autonomous basis of responsibility.

The better view, and the one adopted in this thesis, is that precaution operates primarily as an interpretive standard capable of shaping the content of obligations derived from treaty or custom, and not as an independently operative rule generating free-standing obligations. On this reading it

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[99]Dupuy and Viñuales (n 67) 141.

[100]*Southern Bluefin Tuna Cases (New Zealand v Japan; Australia v Japan)* (Provisional Measures) [1999] ITLOS Rep 280; *MOX Plant Case (Ireland v United Kingdom)* (Provisional Measures) [2001] ITLOS Rep 95; Seabed Disputes Chamber Advisory Opinion (n 88).

[101]ITLOS, Climate Change Advisory Opinion (n 85) para 213.

does not require specific measures in the abstract, but it requires that the standard of due diligence expected in relation to activities posing risks of serious or irreversible harm be calibrated to take account of scientific uncertainty rather than to discount it.[102] Its contested customary status should therefore not be presented as settled in either direction.

3.3.3 The Precautionary Principle as an Intergenerational Mechanism

The connection between precaution and the protection of future generations is structural. The principle addresses irreversibility: harm that, once realised, cannot be remedied by compensation or reparation and therefore forecloses the options of those who come after. Future generations are placed at a particular disadvantage in this respect, since they cannot reverse the relevant decisions and cannot participate in making them. Precaution is one of the doctrines through which this concern is translated into a constraint on present conduct, by requiring that risks of serious or irreversible harm be taken into account before they are established with certainty.

The climate context illustrates the point. The IPCC's assessments indicate that the risk of abrupt and irreversible change increases with the level of warming, and that some consequences, such as the sea-level rise associated with ice-sheet loss, will continue for centuries to millennia.[103] The evidence concerning particular tipping thresholds is subject to uncertainty, and the legal argument does not depend on identifying any particular threshold. It is that, where emissions may contribute to changes that later generations could not reverse, the standard of care expected of States should reflect that possibility.

Biodiversity loss raises the same concern. Extinction is irreversible, and current assessments indicate that species are being lost at rates well above those of the recent past **[SOURCE NEEDED: authoritative scientific assessment of contemporary extinction rates, such as an IPBES global assessment]**. Read in this light, the Convention on Biological Diversity and related instruments may be understood as expecting States to err on the side of conservation when uncertain about the consequences of habitat conversion or the introduction of invasive species.

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[102] Dupuy and Viñuales (n 67) 145–147.

[103] IPCC, *Climate Change 2023: Synthesis Report* (n 82); IPCC, *Global Warming of 1.5°C* (n 5).

3.3.4 Limitations of the Precautionary Principle

The principle's effectiveness as a mechanism of intergenerational protection is limited in several respects. The first concerns the triggering threshold. The Rio formulation restricts the principle to threats of serious or irreversible damage but does not specify what level of risk suffices, or how the magnitude of threatened harm is to be assessed. States accordingly have considerable latitude to characterise risks in ways that minimise the obligations generated, particularly where action would carry economic costs. The requirement of cost-effectiveness, and the more general requirement of proportionality, mean that precaution must be balanced against other legitimate interests and cannot justify any measure claimed to protect the future.

The second concerns the burden of proof. In *Pulp Mills* the ICJ indicated that a precautionary approach may be relevant to the interpretation and application of treaty provisions but does not operate as a reversal of the burden of proof.[104] Precaution therefore remains a guide to the content of due diligence and not a procedural rule, which limits its effect in adjudicated contexts in which evidential standards are decisive.

The third, and arguably the most intractable, concerns implementation. Precaution depends on national political processes that are poorly designed to represent the interests of future generations, since decision-makers face electoral incentives that discount long-term and probabilistic risks against immediate economic benefits. The principle supplies a normative standard against which conduct can be evaluated, but it does not supply the institutional mechanisms, such as independent commissioners for future generations, mandatory long-term impact assessment or intergenerational trust funds, that would give the standard operational force.[105] Section 2.3.3 noted existing domestic models of this kind, and Section 4.9 considers how comparable mechanisms might be designed at the international level. Nothing in the principle itself provides future generations with a representative who can invoke it.

3.3.5 Precaution, Scientific Uncertainty and Irreversibility

The doctrinal point that follows from Sections 3.3.2 to 3.3.4 can be stated briefly. Scientific uncertainty should not automatically justify delay where the potential harm is serious or

[104] *Pulp Mills* (n 89) para 164.
[105] Behrendt (n 23) 3–6; United Nations Secretary-General, *Our Common Agenda* (n 66).

irreversible, since postponement transfers the consequences of uncertainty to persons who cannot participate in the decision. But precaution remains constrained by the evidence, by proportionality, by the seriousness of the risk and by the legal powers available to the decision-maker. The strongest doctrinal understanding is therefore that precaution informs the standard of care required by prevention and due diligence, and does not operate as an autonomous rule that determines the outcome of environmental disputes. That understanding is consistent with the increasingly integrated treatment of scientific knowledge, risk and due diligence in international environmental adjudication.

3.4 Human Rights Obligations and Future Generations

Human-rights law provides a route to the protection of long-term environmental interests that is complementary to, and in some respects independent of, the environmental law examined so far. The connection operates at two levels. Environmental harm threatens the enjoyment of rights that human-rights law already protects, and the recognition of a right to a healthy environment is gradually establishing a more direct link between environmental quality and individual rights. The latter development is reflected in the General Assembly's 2022 resolution recognising a right to a clean, healthy and sustainable environment,[106] which, as a resolution, is not itself binding, and in regional and national practice.[107] The materials in this section come from different legal orders: domestic constitutional law, regional human-rights law, UN treaty-body practice and general international law. They are distinguished below, since a decision in one system does not establish a rule of universal international law.

Domestic courts have been the most active. In *Urgenda* (2019), the Dutch Supreme Court held that the Netherlands was obliged under Articles 2 and 8 of the European Convention on Human Rights to reduce its greenhouse gas emissions sufficiently to avoid an unacceptable risk of serious and irreversible harm to residents of the Netherlands.[108] As Section 2.3.3 notes, the decision remains authoritative. Its reasoning treated the long-term and probabilistic character of climate

[106]UNGA Res 76/300 (28 July 2022) UN Doc A/RES/76/300, 'The human right to a clean, healthy and sustainable environment'.

[107]See generally Alan Boyle, 'Human Rights and the Environment: Where Next?' (2012) 23 European Journal of International Law 613; Jacqueline Peel and Hari M Osofsky, *Climate Change Litigation: Regulatory Pathways to Cleaner Energy* (Cambridge University Press 2015), chs 2–3.

[108]*Urgenda* (n 65) paras 5.2–5.7.

harm as no obstacle to present obligations: the rights invoked were those of present residents, but the risk they faced would materialise over decades, so that present duties were tied to harm lying largely in the future.

The German Federal Constitutional Court's climate order of 2021 developed the temporal logic further. The Court held that the Climate Action Act of 2019 was partly unconstitutional because, by deferring most of the required emission reductions to the period after 2030, it shifted an excessive burden of reduction onto later periods and thereby put at risk the complainants' future freedom, which the Court described as an intertemporal guarantee of freedom.[109] It also read Article 20a of the Basic Law as imposing an objective duty of protection that extends to future generations, but it did not treat future generations themselves as rights-holders before it. The Colombian Supreme Court's *Future Generations* decision (STC4360-2018), noted in Section 2.3.3, belongs to the same trend: in a case brought by young claimants, the Court linked the protection of their rights to the interests of future generations, recognised the Colombian Amazon as a subject of rights and ordered the State to develop an intergenerational pact to combat deforestation.[110] Consistently with the methodology set out in Section 1.4, these decisions are treated as persuasive illustrations and not as evidence of a customary rule. They come from a limited group of jurisdictions and cannot, without broader State practice accompanied by *opinio juris*, establish custom on their own.

At regional level, the European Court of Human Rights held in *Verein KlimaSeniorinnen Schweiz and Others v Switzerland* (2024) that Article 8 of the Convention encompasses a right to effective protection by the State from the serious adverse effects of climate change on life, health, well-being and quality of life, and found that Switzerland had failed to comply with its positive obligations because it had not adequately established a domestic regulatory framework.[111] It also held that associations may, under conditions, act on behalf of individuals affected by climate change, while denying standing to the individual applicants. The judgment is relevant to the

[109]Bundesverfassungsgericht [Federal Constitutional Court], Order of 24 March 2021, 1 BvR 2656/18, paras 182–210.

[110]*Future Generations v Ministry of the Environment and Others*, STC4360-2018 (n 64).

[111]*Verein KlimaSeniorinnen Schweiz and Others v Switzerland* App no 53600/20 (ECtHR, Grand Chamber, 9 April 2024).

representation criterion because it treats representative standing as a functional response to the collective and long-term character of climate harm.

The Inter-American Court of Human Rights has developed the connection in advisory opinions. In Advisory Opinion OC-23/17 it recognised an autonomous right to a healthy environment, linked environmental degradation to Convention rights and elaborated duties of prevention, regulation, supervision, environmental impact assessment and precaution, including in relation to transboundary harm. Its more recent Advisory Opinion OC-32/25 on the *Climate Emergency and Human Rights* develops the climate-specific dimension of those obligations and treats the climate emergency as engaging both substantive and procedural human-rights duties, including a heightened standard of due diligence in light of the gravity and irreversibility of the risk.[112]

Treaty-body practice shows both the potential and the procedural limits of human-rights routes. In *Sacchi and Others v Argentina* and related communications, the Committee on the Rights of the Child accepted that climate-related transboundary harm could, in principle, fall within a State's jurisdiction where the State exercises effective control over the sources of emissions and the harm is reasonably foreseeable, but declared the communications inadmissible for failure to exhaust domestic remedies. The decisions demonstrate an existing route through which young applicants can frame climate harm in rights terms, and expose admissibility and representation barriers that prevent such procedures from becoming a direct mechanism for unborn generations.[113]

At the level of general international law, the 2025 ICJ Advisory Opinion confirmed that climate obligations must be understood together with international human-rights law, rejecting the argument that the climate treaty regime is a *lex specialis* displacing broader human-rights obligations. This strengthens the doctrinal foundation for treating intergenerational environmental protection as a matter of rights and not only of policy, with implications for the enforceability of

[112]Inter-American Court of Human Rights, Advisory Opinion OC-23/17, *Environment and Human Rights*, 15 November 2017; Inter-American Court of Human Rights, Advisory Opinion OC-32/25, *Climate Emergency and Human Rights*, 29 May 2025, requested by Chile and Colombia.

[113]*Sacchi and Others v Argentina*, Communication No 104/2019, Committee on the Rights of the Child, Decision adopted 22 September 2021, UN Doc CRC/C/88/D/104/2019, especially paras 10.4–10.14 and 10.18–10.21; see also the related communications against Brazil, France, Germany and Turkey.

obligations and for the standing of representatives of future generations.[114] Section 4.4 considers what each of these developments adds and where it remains limited.

3.4.1 Human Rights as a Complementary Route to Intergenerational Protection

The materials above show why human-rights law and environmental law are best understood as complementary. Environmental law regulates ecological systems, prevention, cooperation and State conduct. Human-rights law translates environmental degradation into legally protected human interests: life, health, private and family life, culture, food, water and housing. Climate change demonstrates why the two bodies of law overlap, since environmental deterioration undermines the factual conditions on which the enjoyment of rights depends.

The contribution of human-rights law to intergenerational protection can be summarised in five features. It is anchored in present rights-holders, who can bring claims. It recognises intertemporal effects, in that the freedoms and interests of present persons, including children and young people, are affected by decisions whose consequences lie in the future. It reinforces prevention by attaching the duty of protection to foreseeable long-term harm. It supplies procedural rights of access to information, participation and effective remedies. And it operates through institutions that already exist and have jurisdiction. Cases brought on this basis may generate standards that also protect those who will live with the later consequences of present emissions.

Its limitation is equally clear. Persons not yet born generally cannot invoke existing complaint mechanisms, and the jurisdiction of human-rights bodies is structured around identifiable rights-holders and present legal relationships. Existing children, communities, States and public-interest actors may invoke present obligations whose protective logic extends forward in time, but no mechanism considered in this section permits a person not yet born to appear or to be represented in their own right. Human-rights law therefore narrows the representation gap without eliminating it.

This conclusion connects to the theoretical framework of Chapter 2. Human-rights law is accustomed to probabilistic harm, diffuse causation and obligations owed to classes of persons rather than identified individuals, and so offers a partial response to the non-identity problem discussed in Section 2.3.1. It also avoids the need to treat future generations as a homogeneous

[114] ICJ, Climate Change Advisory Opinion (n 80) paras 162–171; Gallarati (n 21) 68–71.

legal subject, since the interests of future persons will differ across geography and vulnerability. The interest-based account of Section 2.3.2 explains why future interests can ground present duties. Associational standing of the kind recognised in *KlimaSeniorinnen* is a functional analogue of the trusteeship model, since it allows a collective actor to bring long-term interests before a court, but it remains a form of representation of present persons. Whether comparable arrangements could be extended to represent future generations as such is a question for the reform proposals in Section 4.9.

3.5 Sustainable Development as an Operative Principle of International Environmental Law

3.5.1 Sustainable Development within the Architecture of International Environmental Law

Chapter 2 treated sustainable development as a theoretical and interpretive bridge between intergenerational equity and positive law. This section examines its operative role within positive international environmental law, where it performs a function in five areas: the interpretation of treaties, the balancing of environmental and developmental considerations, the governance of natural resources, the integration of environmental considerations into development decisions, and judicial reasoning. As Dupuy and Viñuales note, sustainable development now 'permeates' environmental treaty regimes and shapes the interpretation of obligations relating to natural resource management, environmental impact assessment and the integration of environmental considerations into development policy.[115] The question is whether it has itself acquired the status of a binding principle capable of generating independent legal consequences, or continues to function as an interpretive guide.

3.5.2 The Legal Status of Sustainable Development as an Operative Principle

Two authorities are central, and both were introduced in Section 2.2.3. In *Gabčíkovo-Nagymaros*, the ICJ treated the need to reconcile economic development with the protection of the environment as expressed in the concept of sustainable development, and applied the concept as a consideration to be taken into account in interpreting and applying the parties' treaty obligations. Judge

[115]Dupuy and Viñuales (n 67) 72–82.

Weeramantry's separate opinion went further and described sustainable development as a principle with normative value.[116] The majority did not treat it as an independent source of obligation.

In *Iron Rhine*, the tribunal considered that environmental law and the law on development are mutually reinforcing, that where development may cause significant harm to the environment there is a duty to prevent, or at least to mitigate, that harm, and that this duty had become a principle of general international law.[117] The tribunal applied that principle to practical questions between the parties, including questions of cost.

Read together, these authorities show that, even where courts stop short of treating sustainable development as a free-standing source of binding obligation, it exercises real legal authority at the operative level. It shapes the meaning of treaty obligations, structures the balancing of competing environmental and developmental interests and, as *Iron Rhine* illustrates, can bear on the allocation of costs and responsibilities where treaty law is silent. As Section 2.2.3 concluded, however, the authorities do not establish sustainable development as an independently binding rule, and this chapter does not treat it as one.

3.5.3 Sustainable Development, Intergenerational Equity, and the Question of Direct Interpretive Authority

The question that follows is the one raised at the close of Section 2.2.3: can intergenerational equity acquire direct interpretive authority comparable to that of sustainable development? The answer must be qualified. Sustainable development has acquired its interpretive authority through a combination of judicial recognition, treaty embeddedness and institutional practice that intergenerational equity has not yet replicated. Intergenerational equity enters judicial reasoning primarily as a component of sustainable development, or as part of the contextual background against which environmental obligations are interpreted, and not as a self-standing rule capable of generating specific legal consequences independently. This is consistent with the position adopted in Section 2.1.4, that intergenerational equity has not yet crystallised into a rule of customary international law and operates as a legally significant interpretive principle.

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[116] *Gabčíkovo-Nagymaros* (n 46) para 140; see also the Separate Opinion of Vice-President Weeramantry (n 55) 88–90.

[117] *Iron Rhine Railway (Belgium v Netherlands)* (Award) PCA, 24 May 2005, para 59.

That does not make it legally irrelevant. Intergenerational equity may influence the standard of due diligence expected of States in relation to long-term environmental harm, the application of precaution where irreversible consequences for future populations are at stake, the interpretation of obligations whose effects extend over long periods, the assessment of irreversible environmental risks and the understanding of the temporal dimension of State obligations. It may also help to explain why long-term benchmarks such as the Paris temperature goals are treated as legally significant in assessing conduct. As Dupuy and Viñuales note, principles of this kind function at the level of 'legal philosophy' within the system of international environmental law, shaping the trajectory of doctrinal development even where they do not produce directly enforceable outcomes in individual cases.[118]

The 2025 ICJ Advisory Opinion, examined in Section 4.2.1, offers some tentative support for the view that intergenerational equity may be acquiring a more direct operative role. The Court characterised intergenerational equity as a manifestation of equity and stated that due regard for the interests of future generations and the long-term implications of State conduct must be taken into account when States formulate and implement measures in fulfilment of their obligations.[119] That can be read as applying intergenerational equity as a normative orientation that shapes the content of specific obligations, and not merely as background. Whether it marks the beginning of a more direct interpretive authority, or remains a refraction of the principle through sustainable development and due diligence, is a question on which the Opinion is suggestive rather than conclusive; its detailed analysis is reserved for Chapter 4. For the purposes of this chapter, the safer conclusion is that intergenerational equity currently operates through the doctrines examined above and does not itself independently create obligations.

3.6 Chapter Synthesis: From Intergenerational Principle to Operational Duties

The preceding sections show that international law does not protect future generations through a single autonomous rule. Protection emerges instead from a network of treaty obligations, customary duties and interpretive principles which together translate the normative idea of

[118]Dupuy and Viñuales (n 67) 72–82.
[119]ICJ, Climate Change Advisory Opinion (n 62) paras 155–157 and 161.

intergenerational equity into present legal duties, indirectly and unevenly. Prevention and due diligence regulate the standard of State conduct; cooperation and environmental assessment operationalise it; precaution informs its intensity under uncertainty; human-rights law connects environmental degradation to protected human interests; and sustainable development provides a framework for integrating environmental protection with developmental needs. This section evaluates that network against the four criteria set out in Sections 1.2.1 and 1.4.

3.6.1 Legal Status and Binding Force

The framework contains protections of different legal status. Binding treaty obligations include those of the UNFCCC, the Kyoto Protocol, the Paris Agreement (in respect of its conduct and procedural obligations), the CBD and UNCLOS. Customary international law supplies the no-harm rule, the duty of prevention, the standard of due diligence and the obligation to assess significant transboundary environmental effects. Precaution, sustainable development and intergenerational equity operate principally as interpretive or general principles whose independent customary status is contested or has not been established. Soft-law instruments, namely the Stockholm and Rio Declarations, Agenda 21, the Kunming-Montreal Framework and the 2024 Declaration on Future Generations, supply normative vocabulary and evidence of practice but do not themselves bind.

The legal significance of explicit references to future generations is correspondingly uneven. They are concentrated in preambles, statements of principle and soft-law instruments, and where they appear in treaty text, as in Article 3(1) of the UNFCCC, they are formulated in hortatory terms. The strongest protection is therefore not found where the phrase ‘future generations’ appears. It lies in binding doctrines of prevention and due diligence whose anticipatory structure protects long-term interests without naming those who hold them.

3.6.2 Precision

Precision varies considerably. The most concrete standards are procedural or conduct-based: the obligation to assess significant transboundary effects, the obligation to prepare, communicate and maintain contributions, and the due diligence standard as elaborated by ITLOS and the ICJ, which is calibrated to the best available science. The quantified targets of Article 3 of the Kyoto Protocol were the most precise substantive commitments in the climate regime, but they have not been

replicated in the Paris Agreement, where the temperature goals are collective benchmarks and the content of each contribution is determined by the Party concerned. Precaution is affected by threshold indeterminacy, sustainable development and intergenerational equity are open-textured, and the general obligations of the CBD and UNCLOS leave the specific measures required to States' own assessment of their obligations.

Substantial discretion therefore remains. A recurring feature is that the law supplies standards of conduct and not guaranteed outcomes. That is appropriate to the diffuse and long-term character of the harm, but it means that States are constrained by reference to reasonableness and science and not by reference to fixed results.

3.6.3 Monitoring, Compliance, Responsibility and Remedy

The existence of substantive duties does not guarantee their enforcement. Compliance mechanisms are largely facilitative: the Paris compliance committee is non-adversarial and non-punitive, and the more rigorous mechanism of the Kyoto Protocol has not been replicated. Judicial review depends on jurisdiction, admissibility and the consent of States, and advisory opinions clarify the law without binding. Contentious proceedings require proof of breach and, where compensation is sought, causation and injury, which are difficult to establish for cumulative and long-latency harm. Human-rights procedures offer more effective remedies, but only to present applicants and subject to admissibility conditions, as *Sacchi* shows. Enforcement at the international level therefore remains dependent on present States choosing to invoke the obligations and on political implementation. Section 4.6 examines these limits in relation to the recent advisory opinions.

3.6.4 Representation

The fourth criterion exposes the framework's most persistent gap. No general mechanism permits persons not yet born, or a representative acting in their name, to place their interests before a decision-maker. Their interests can reach international decision-making only indirectly: through States, which may invoke obligations in their own right and act as imperfect proxies; through children and young people, who may bring rights-based claims, as in *Sacchi*; through public-interest organisations, whose standing has been recognised in some systems, as in *KlimaSeniorinnen*; and through human-rights applicants generally. Institutional representatives exist in some domestic systems and are proposed at the international level, but the 2024

Declaration on Future Generations does not create one. Each indirect route depends on present actors choosing to act and on admissibility rules designed for present claimants.

3.6.5 Substantive Protection and Institutional Representation

Table 3.1 summarises the assessment across the principal instruments and principles examined in this chapter.

Table 3.1: Protection of future generations across the principal instruments and principles, assessed against the four criteria

Instrument or principle	Legal status	Precision	Monitoring, compliance, responsibility and remedy	Representation
Stockholm, Rio, Agenda 21, Kunming-Montreal Framework, 2024 Declaration	Soft law or political commitment; influence through interpretation and practice	Low: aspirational or target-based formulations	None directly; implementation left to States and institutions	None
UNFCCC, Kyoto Protocol, Paris Agreement	Binding treaties; references to future generations mainly in preambles and hortatory principles	Kyoto: quantified targets. Paris: collective temperature benchmark and conduct obligations; contributions self-determined	Kyoto: compliance mechanism. Paris: facilitative, non-punitive review	None in negotiation or implementation
CBD and UNCLOS	Binding treaties with general obligations	Low to moderate: measures left to States; ITLOS 2024 adds precision for UNCLOS	UNCLOS dispute settlement and advisory jurisdiction; CBD reporting and review	None
No-harm rule and duty of prevention	Customary law	Moderate: content mediated by due diligence	Inter-State responsibility, limited by jurisdiction, admissibility, proof and causation	None; States act as imperfect proxies
Due diligence and impact assessment	Standard of conduct within binding obligations; assessment required by general international law for significant transboundary harm	Contextual; benchmarked to best available science	Reviewable before harm materialises	None

Instrument or principle	Legal status	Precision	Monitoring, compliance, responsibility and remedy	Representation
Precautionary principle	Contested: interpretive approach or general principle; customary status not settled	Low: threshold indeterminacy	No reversal of the burden of proof	None
Human-rights law	Binding (treaty and constitutional law)	Moderate to high in case law	Strongest: courts and treaty bodies, subject to admissibility	Indirect: present claimants, children, associations; persons not yet born cannot apply
Sustainable development	Contested: operative interpretive principle	Low	Operates through interpretation and balancing (*Iron Rhine*)	None
Intergenerational equity	Not established as an autonomous customary rule (Section 2.1.4); interpretive principle	Low	No independent enforcement	None

Source: author's assessment, based on Sections 3.1 to 3.5.

The assessment supports a distinction that is central to the thesis. As to substantive protection, international environmental law increasingly provides tools capable of protecting future interests. Prevention, due diligence, environmental assessment, precaution as an interpretive standard, human-rights protection and sustainable development each integrate long-term considerations into present duties. The protection they produce is real but indirect, and it varies in precision and legal status. As to institutional and procedural representation, the framework remains comparatively underdeveloped: enforcement is limited, and future generations lack standing or any representative able to invoke the obligations on their behalf.

The distinction explains why the intergenerational significance of legal developments cannot be measured only by whether obligations have become clearer. An obligation may become more precise and yet remain difficult to invoke on behalf of persons who do not yet exist. It corresponds to the first two hypotheses set out in Section 1.2.3: recognition that does not consistently translate into clear and operative duties (the adequacy gap), and institutions of supervision and enforcement that depend on present States (the enforcement deficit).

3.6.6 Transition to Chapter 4

International environmental law therefore already contains norms capable of protecting future generations. The next question is whether recent international adjudication has made those norms sufficiently precise, reviewable and enforceable to change their practical legal significance. Chapter 4 examines, in particular, the 2024 ITLOS Advisory Opinion, the 2025 ICJ Advisory Opinion on climate change and the relevant human-rights jurisprudence, in order to determine whether recent judicial developments strengthen the protection of future generations and whether they overcome, or merely expose more clearly, the continuing gaps in enforcement and representation. That question corresponds to the third hypothesis set out in Section 1.2.3.

Chapter 4: The 2024 ITLOS and 2025 ICJ Advisory Opinions on Climate Change

4.1 Background and Legal Context of the Recent Advisory Proceedings

The request for an advisory opinion from the International Court of Justice on States' responsibility to address climate change originated outside conventional diplomatic channels. It began with a group of law students from the University of the South Pacific in Vanuatu, one of the Pacific Island nations most vulnerable to rising sea levels and intensifying storms associated with climate change. Their 2019 campaign developed into a global movement, eventually persuading the Government of Vanuatu to advance the initiative through multilateral diplomatic channels.[120]

The political process that followed was notable for its breadth. Vanuatu led a coalition that grew to include small island developing States (SIDS), Latin American countries, African States, and a substantial number of other UN Member States. On 29 March 2023, the General Assembly adopted Resolution 77/276, based on the draft resolution A/77/L.58, which was co-sponsored by 132 States — a broad and geographically diverse coalition spanning climate-vulnerable developing countries and larger emerging economies.[121] The Resolution requested that the ICJ issue an advisory opinion on States' obligations in relation to climate change, making it one of the most widely supported requests in the Court's history.

The ICJ request did not emerge in isolation. A parallel initiative pursued by the Commission of Small Island States on Climate Change and International Law (COSIS) — established in 2021 by Antigua and Barbuda and Tuvalu, and later joined by Palau, Niue, Vanuatu, Saint Lucia, Saint Vincent and the Grenadines, the Bahamas and Saint Kitts and Nevis — led ITLOS to receive its own request for an advisory opinion on 12 December 2022, some three-and-a-half months before the General Assembly adopted Resolution 77/276.[122] COSIS asked the Tribunal to specify States

120 Pacific Islands Students Fighting Climate Change, 'Our Journey', <https://www.pisfcc.org/our-journey/> accessed 24 September 2026.

121 UNGA Res 77/276 (29 March 2023) UN Doc A/RES/77/276.

122 ITLOS, Climate Change Advisory Opinion (n 85).

Parties' obligations under UNCLOS, including Part XII, to prevent, reduce and control pollution of the marine environment from climate change, and to protect and preserve the marine environment against its effects.[123] The Tribunal delivered its Opinion unanimously on 21 May 2024, some fourteen months before the ICJ — making it an important early international judicial statement devoted specifically to States' climate obligations.

The two requests were not formally coordinated, but they drew on an overlapping constituency of climate-vulnerable States and, to a significant extent, overlapping written and oral submissions. As section 4.5 below shows, the relationship between the two Opinions is not merely a matter of comparison after the fact: the body that answered second read, and expressly engaged with the reasoning of, the body that answered first. The remainder of this chapter proceeds accordingly. Section 4.2 examines the ICJ Opinion; section 4.3 examines the ITLOS Opinion; section 4.4 considers the international human-rights jurisprudence that has developed alongside both; section 4.5 compares the ITLOS and ICJ Opinions directly; and sections 4.6 and 4.7 assess, respectively, what the combined body of jurisprudence leaves unresolved and how it has so far been institutionally received. Sections 4.8 and 4.9 then set out the conclusions of the analysis and develop reform proposals, and section 4.10 offers final reflections.

The first question posed to the Court was: what are States' obligations under international law to protect the climate system and other areas of the environment from anthropogenic greenhouse gas emissions for current and future generations? This matter required the Court to examine all available international law — treaty law, customary international law, and general principles — and to clarify, as precisely as feasible, the essence of States' climate commitments. The explicit reference to 'present and future generations'[124] incorporated an intergenerational dimension directly into the parameters of the question, making it impossible for the Court to limit its consideration to the interests of living people.

The second question asked: what are the legal consequences under these obligations for States that, through their acts and omissions, have caused significant harm to the climate system and other

123 ITLOS, Climate Change Advisory Opinion (n 85).
124 UNGA Res 77/276 (n 121), operative para 1(a).

lying developing countries, taking into account individuals of the present and future generations affected by the adverse effects of climate change? This inquiry required the Court to explore the implications of breach, including questions of State accountability, restitution, and the special status of the most climate-vulnerable States, giving the resulting Opinion a potential remedial dimension that pure obligation analysis would not have provided.[125]

4.1.1 Why the Advisory Proceedings Matter for Intergenerational Equity

The ITLOS and ICJ advisory proceedings are significant not because advisory opinions create a legislature for climate policy, but because they clarify how existing international law applies to a problem characterised by cumulative causation, scientific complexity and long-term harm. For future generations, the central issue is whether legal obligations can operate before injury is individualised and before all affected persons exist. The advisory opinions provide an unusually authoritative setting in which prevention, due diligence, cooperation, scientific evidence and long-term interests can be examined together.

They also test a persistent argument in climate law: that the specialised treaty regime exhausts States' legal obligations. If the UNFCCC and Paris Agreement displaced general international law, the protection of future generations would depend heavily on the design and enforcement limits of that treaty framework. By contrast, the continued relevance of customary prevention, cooperation, human rights and the law of State responsibility creates overlapping legal pathways and potentially strengthens accountability.

4.2 The ICJ Advisory Opinion: State Obligations and Climate Harm

One of the most notable aspects of the ICJ's Advisory Opinion is the scope of the legal framework the Court identified as applicable to climate change. Rather than confining its analysis to the climate treaty regime — the UNFCCC, the Kyoto Protocol, and the Paris Agreement — the Court examined a broad range of international law sources and concluded that multiple legal regimes impose overlapping and mutually reinforcing obligations on States.[126]

[125] UNGA Res 77/276 (n 121). UNGA Res 77/276 (n 121), operative para 1(b)(i)-(ii).

[126] ICJ, Climate Change Advisory Opinion (n 80). ICJ, Climate Change Advisory Opinion (n 80) paras 112-171.

The Court confirmed that the UNFCCC, the Kyoto Protocol, and the Paris Agreement are complementary and mutually reinforcing instruments, finding no conflict between them and rejecting the argument advanced by a coalition of high-emitting industrialised States that the Paris Agreement, as the more specific and recent instrument, should supersede obligations derived from the UNFCCC or customary international law.[127] This rejection of the *lex specialis* and *lex posterior* arguments was significant because it meant that the Paris Agreement's flexibility mechanisms, particularly the nationally determined contributions, did not exhaust States' climate obligations, which are still shaped by the broader framework of international law.

Aside from the climate treaty regime, the Court relied on UNCLOS, expressly according weight to the ITLOS Advisory Opinion's findings on States' obligations to protect the marine environment from climate change — a relationship examined directly in section 4.5 below — as well as on international human rights instruments, the Convention on Biological Diversity, and the customary no-harm rule. This integrative approach resulted in a more comprehensive and exacting assessment of States' climate duties than any single treaty regime could have created.

Perhaps the most significant result of the Advisory Opinion was the Court's treatment of the Paris Agreement's long-term temperature goals. The Court confirmed that States parties are bound by obligations of conduct under the Agreement, including the obligation under Article 4 to prepare, communicate and implement successive nationally determined contributions designed to achieve the Agreement's temperature goals. The Court confirmed that States' discretion in designing their contributions, while genuine, is constrained by the obligation to act in good faith and to calibrate their ambition to what the best available scientific evidence indicates is necessary.[128] This narrows the space within which States can treat their NDCs as purely self-defined political commitments. A contribution that is manifestly inconsistent with the best available science, or a persistent failure to implement a communicated NDC, may indicate a failure to comply with the obligations of good faith, progression, and due diligence identified by the Court. Whether a breach has occurred would

127 ICJ, Climate Change Advisory Opinion (n 80).
128 ICJ, Climate Change Advisory Opinion (n 80).

still require an assessment of the relevant obligation, the State's circumstances, and the measures actually taken; it cannot be inferred from an emissions trajectory alone.[129]

The Court elaborated at length on the content of States' due diligence obligations in the climate context. It confirmed that due diligence requires States to establish and execute domestic measures — law, regulation, and policy — to achieve the Paris Agreement's temperature targets, guided by the best available research as represented in IPCC assessments. The applicable standard of due diligence is not static; it evolves as scientific knowledge develops and as the severity and foreseeability of climate-related risks become clearer.[130] The Court also considered whether due diligence is evaluated individually or collectively, and rejected the position advanced by certain major emitters that a single State's emissions are too small in global terms to ground accountability: each State is subject to its own due diligence obligations, irrespective of the relative size of its contribution to global emissions.

Addressing the second question, the Court confirmed that the general law of State responsibility, as reflected in the ILC's Articles on the Responsibility of States for Internationally Wrongful Acts, applies in the climate change context, that breaches of the applicable due-diligence standard may constitute internationally wrongful acts, and that the resulting consequences include cessation, non-repetition and, where applicable, reparation — while candidly acknowledging the significant evidentiary and legal difficulties of attributing specific climate impacts to individual States' emissions.[131] The Court underlined the vulnerability of small island developing States and low-lying developing countries, reaffirming that their circumstances must be taken into account when applying the doctrine of State responsibility.

4.2.1 Intergenerational Equity in the 2025 ICJ Opinion

A particularly important feature of the 2025 ICJ Advisory Opinion is its express treatment of intergenerational equity among the principles guiding the interpretation and application of the most directly relevant legal rules. The Court's approach does not elevate intergenerational equity into a

129 ICJ, Climate Change Advisory Opinion (n 80).

130 ICJ, Climate Change Advisory Opinion (n 80).

131 ICJ, Climate Change Advisory Opinion (n 80); International Law Commission, Articles on Responsibility of States for Internationally Wrongful Acts, annexed to UNGA Res 56/83 (12 December 2001) UN Doc A/RES/56/83.

self-standing source of obligations. Instead, it gives the concept practical interpretive significance by requiring attention to the interests of future generations and the long-term implications of conduct when States formulate and implement measures under applicable treaty and customary rules.

This formulation is doctrinally important because it links an abstract idea of fairness between generations to the performance of concrete legal obligations. Due regard for future interests can affect how a State identifies relevant risks, how far ahead an environmental assessment looks, how it evaluates carbon-intensive infrastructure, and how it justifies the ambition and implementation of mitigation measures. The concept therefore operates less as an independent cause of action and more as a lens through which the reasonableness and diligence of present conduct may be assessed.

The Opinion also reduces the force of the objection that diffuse causation makes climate obligations legally indeterminate. The Court recognised the customary duty to prevent significant environmental harm as applicable to the climate system and treated due diligence as the relevant standard of conduct. Responsibility does not arise merely because a desired climatic result is not achieved; the inquiry concerns whether the State took the measures within its power that the applicable standard required. This conduct-based structure is well suited to intergenerational harm because it allows legal scrutiny before the full consequences of climate change materialise.

4.3 The 2024 ITLOS Advisory Opinion

Sections 3.1.7 and 3.2 have already established that ITLOS confirmed States' obligations to protect the marine environment from climate change under UNCLOS, applying alongside the climate treaty regime, and that the applicable due-diligence standard requires measures consistent with the best available science. What that account does not yet supply is a closer examination of how the Tribunal reached that result, what precisely it requires of States, and what it leaves open. That is the task of this section.

The Tribunal's conclusion that UNCLOS applies to climate change at all rested on an interpretive move that is not merely a restatement of Articles 192 and 194. Article 1(1)(4) of UNCLOS defines 'pollution of the marine environment' as the introduction, directly or indirectly, of substances or

energy into the marine environment which results or is likely to result in deleterious effects.[132] Before the Opinion, it remained a live question, raised by several participating States, whether emissions released into the atmosphere, rather than discharged directly into the sea, could be brought within that definition. The Tribunal held that they can: the oceans absorb atmospheric heat and carbon dioxide, producing ocean warming, sea level rise and ocean acidification, and this indirect introduction of 'energy' into the marine environment, with its demonstrated deleterious effects, satisfies the treaty definition.[133] This is best understood as an evolutive reading of a 1982 pollution concept, extending it to a physical mechanism the drafters of UNCLOS are unlikely to have contemplated; whether that is better characterised as legitimate evolutive interpretation or as a more creative act of judicial development is a question the Opinion does not resolve explicitly. What is clear is the doctrinal effect: once GHG emissions are classified as marine pollution, the relevant obligations in Part XII of UNCLOS may apply to the effects of anthropogenic GHG emissions on the marine environment, according to the conditions of each provision. Those obligations operate alongside the UNFCCC and Paris Agreement rather than being exhausted by them.

Having brought GHG emissions within Article 194, the Tribunal specified the content of the resulting due-diligence obligation more precisely than the general 'best available science' formulation already noted in Chapter 3. It held that the standard of due diligence States must exercise in relation to marine pollution from anthropogenic GHG emissions 'needs to be stringent, given the high risks of serious and irreversible harm to the marine environment from such emissions.'[134] The Tribunal further held that the standard scales with capacity: 'a State with greater capabilities and sufficient resources is required to do more than a State that is not so well placed.'[135] This capacity-sensitive formulation is doctrinally significant for the intergenerational analysis developed in Chapter 2: it links the substantive content of a due-diligence obligation directly to a State's capacity, producing an asymmetric standard that tracks differentiated responsibility more

132 United Nations Convention on the Law of the Sea (n 84) art 1(1)(4).
133 ITLOS, Climate Change Advisory Opinion (n 85).
134 ITLOS, Climate Change Advisory Opinion (n 85) para 241. See ITLOS, Climate Change Advisory Opinion (n 85) paras 239-243.
135 ITLOS, Climate Change Advisory Opinion (n 85). ITLOS, Climate Change Advisory Opinion (n 85) paras 239-243, 398-399.

directly, and in a more legally operative way, than the correspondingly worded but comparatively unelaborated common-but-differentiated-responsibilities language of the UNFCCC.

Importantly, and in a holding that Chapter 3 does not address, the Tribunal rejected the proposition, advanced by several participating States, that compliance with the Paris Agreement — including the preparation and communication of nationally determined contributions — automatically satisfies a State's due-diligence obligations under Article 194: the two obligations are related and mutually informative, but discharging one does not discharge the other.[136] This forecloses what would otherwise have been an available argument for a respondent State: that submitting an NDC, however modest, is by itself a complete answer to a UNCLOS-based challenge. It also means that a State's conduct can now be tested against two formally distinct due-diligence standards — one under the Paris Agreement, one under UNCLOS — rather than a single, self-referential one.

The Opinion's contribution should not be overstated. Three limitations qualify it. First, its reach is narrower than the marine-environment framing might suggest: because the request was framed under UNCLOS, the Tribunal's findings speak directly only to the protection of the marine environment, and the Opinion engages with human rights only in passing — a point taken up in section 4.4 below. Second, 'stringent' due diligence is a directional instruction to future adjudicators rather than a self-executing rule: although the Tribunal treated the Paris temperature goal and the timeline for emission pathways as relevant factors in determining the necessary measures, it did not translate them into a quantified benchmark for individual States, so what the standard requires of any particular State's regulatory conduct remains to be settled through subsequent litigation this Opinion cannot itself supply. Third, like the ICJ Opinion, it is not binding, creates no direct enforcement mechanism, and does not alter the structural position of future generations examined throughout this thesis: individuals, and future generations *a fortiori*, cannot appear before the Tribunal, and the stringent standard, however useful in future proceedings, remains one that must be invoked by a State or international organisation rather than by any directly affected person.

For the protection of future generations, the significance of this Opinion is best stated with these limits in view. It supplies, for the marine environment specifically, exactly the kind of judicially

[136]ITLOS, Climate Change Advisory Opinion (n 85). ITLOS, Climate Change Advisory Opinion (n 85) paras 215-223, 239-243, 398-399.

fixed, capacity-adjusted and demanding standard of care that Chapter 3 found generally lacking in treaty formulations of due diligence, and it does so under a treaty with broad international participation, independently of the political dynamics of the UNFCCC negotiations. A generation born several decades from now will, on this reasoning, benefit from the fact that an existing treaty cannot be neutralised by a State's compliance with a different, more politically contingent regime. What it does not do is specify, in advance, what that standard concretely requires, or supply any actor capable of invoking it on behalf of persons not yet born; both tasks remain, as section 4.6 discusses, for present claimants and later tribunals to complete.

4.3.1 The Contribution of ITLOS to a Climate Due-Diligence Standard

ITLOS approached climate change through the law of the sea, but its reasoning has consequences beyond the marine environment. The Tribunal's 21 May 2024 Advisory Opinion confirmed that anthropogenic greenhouse-gas emissions can constitute marine pollution within the meaning of UNCLOS and emphasised the demanding character of due diligence in light of the risks posed by climate change. The significance for intergenerational protection lies in the conversion of scientific knowledge about long-term ocean harm into present obligations of conduct.

Ocean warming, acidification and sea-level rise illustrate why a temporally narrow conception of prevention is inadequate. Marine impacts can continue after the activities that contributed to them, and some effects may be effectively irreversible on human time scales. By requiring States to take necessary measures and to act with due diligence informed by the best available science, the ITLOS framework supports anticipatory regulation. It thereby protects future interests without requiring the Tribunal to recognise future generations as independent parties to the proceedings.

The limits of the Opinion should nevertheless be kept clear. ITLOS interpreted obligations within UNCLOS and did not establish a universal institutional mechanism for representing future generations. Nor does a demanding due-diligence standard automatically solve questions of attribution, remedy or implementation. Its contribution is primarily doctrinal: it confirms that climate-related environmental harm falls within existing legal regimes and that scientific uncertainty or the global character of emissions does not remove the obligation to act.

4.4 International Human Rights, Climate Change and Future Generations

Section 3.4 has already established, at the level of doctrinal framework, that the 2025 ICJ Advisory Opinion, the Inter-American Court's Advisory Opinions OC-23/17 and OC-32/25, and the Committee on the Rights of the Child's decision in *Sacchi* together confirm that human-rights law reaches climate policy at the international level. This section does not restate those holdings. It asks the comparative and critical question Chapter 3 leaves open: what, specifically, does each of these developments add to the protection of future generations, and where does each remain limited?

The ICJ's own human-rights holding is, in one respect, the most far-reaching of the three. Drawing on the submissions before it, the scientific record, and the practice of international and regional human-rights bodies, the Court recognised that the adverse effects of climate change may significantly impair the enjoyment of a broad range of internationally protected human rights, including the right to life, the right to health, and the right to an adequate standard of living — encompassing access to food, water and shelter — and identified women, children and Indigenous Peoples as groups of heightened vulnerability.[137] Rejecting the *lex specialis* argument, the Court confirmed that human-rights obligations under the ICCPR, the ICESCR and customary international law apply alongside, rather than being displaced by, the climate treaty regime.[138] What this adds, specifically, is scope: because the ICJ's holding is not confined to any one regional system, it is, in principle, available wherever a State has accepted the relevant human-rights instruments, which is a considerably larger set of States than are bound by either the American Convention or the constitutive instruments of the Inter-American system.

What OC-32/25 adds beyond OC-23/17, and beyond the ICJ, is specificity rather than scope. Where OC-23/17 established a general, autonomous right to a healthy environment and elaborated preventive, procedural and extraterritorial duties, OC-32/25 recalibrates those duties specifically to the climate emergency, treating the gravity and irreversibility of climate risk as itself warranting

137 ICJ, Climate Change Advisory Opinion (n 80).
138 ICJ, Climate Change Advisory Opinion (n 80).

a heightened standard of due diligence.[139] That recalibration runs in substantially the same direction as the ICJ's and ITLOS's own move towards a demanding, risk-calibrated due-diligence standard, discussed in section 4.5 below — a third, regionally confined body reaching a materially similar conclusion by a different institutional route. The addition is corroborative rather than independent: OC-32/25 does not extend the substantive protection available to future generations much beyond what the ICJ Opinion already supplies for States bound by both instruments, but it does supply a regionally specific, more procedurally developed articulation — access to information, participation, access to justice — of what that due diligence requires in practice, which the ICJ Opinion, addressing a global and doctrinally broader question, does not attempt in comparable detail.

Sacchi adds a different, and more cautionary, kind of evidence. Its holding — that climate-related transboundary harm can, in principle, engage a State's jurisdiction under the Convention on the Rights of the Child where the State exercises effective control over the sources of emissions and the harm is reasonably foreseeable — is the most direct confirmation available that a UN treaty body is prepared to treat diffuse, transboundary climate harm as capable of founding a rights claim by children, who are, of the various present right-holders considered in this thesis, the class whose own life-course extends furthest into the future. What it withholds is at least as significant as what it grants: the communications were declared inadmissible for non-exhaustion of domestic remedies, so the Committee's substantive reasoning on jurisdiction has not yet been tested against a claim that actually proceeds to the merits.[140] Read against the ICJ's and the Inter-American Court's Opinions, *Sacchi* illustrates a general pattern in this body of jurisprudence: substantive doctrine has moved further and faster than the procedural mechanisms needed to give it effect in a contested case.

Assessed against the four adequacy criteria used throughout this thesis, the combined human-rights jurisprudence performs unevenly. On binding force, its position is mixed: the Inter-American and ICJ Opinions are advisory and therefore not binding as such, while *Sacchi*'s own procedural posture means its substantive holding has not yet been applied in a binding decision on the merits by any body considered here. On precision, the jurisprudence performs comparatively well: three

139 Inter-American Court of Human Rights, Advisory Opinions OC-23/17 and OC-32/25 (n 112).
140 Sacchi and Others v Argentina (n 113).

institutionally distinct bodies, together with the European Court of Human Rights in *KlimaSeniorinnen* (Section 3.4), have now converged on the proposition that human-rights obligations require States to address foreseeable, serious climate harm, which is a materially more precise statement than the general aspirational language found in much of the treaty law examined in Chapter 3. On enforcement, the position remains largely as Chapter 3 described it: present applicants have real, if procedurally constrained, avenues, while future generations have none of their own. On representation specifically, the jurisprudence narrows the gap identified in Chapter 1 without closing it: existing children, communities and States can invoke long-horizon interests through it, but no mechanism considered in this section allows a person not yet born to appear, or to be represented, in their own right.

4.4.1 Regional Human-Rights Jurisprudence and the Temporal Dimension of Climate Harm

Regional and domestic human-rights jurisprudence adds a further layer to the international advisory opinions by showing how long-term environmental risk can be translated into claims brought by identifiable present-day applicants. Children, young people, Indigenous communities and persons exposed to climate-related hazards may invoke existing rights while also drawing attention to harms that will intensify over time. This does not erase the doctrinal distinction between present persons and future generations, but it can narrow the representation gap by ensuring that long-term consequences are legally visible before they become irreversible.

The most defensible use of such jurisprudence in this thesis is therefore comparative and complementary. Human-rights decisions do not by themselves establish a universal international rule granting standing to unborn persons. They demonstrate, however, that courts can incorporate scientific projections, vulnerability and long-term consequences into the interpretation of present obligations. That practice supports the broader argument that intergenerational protection can be operationalised through existing legal categories while institutional reform addresses the remaining representational deficit.

4.5 ITLOS and ICJ: Complementary Judicial Approaches

Having examined the two Opinions separately, it is now possible to compare them directly. They are not usefully compared as a list of differences, because most of their differences are explained

by a single underlying fact: ITLOS answered a narrower question first, and the ICJ answered a broader question second while expressly building on ITLOS's answer.

ITLOS is narrower than the ICJ because its jurisdiction is narrower: a request framed under UNCLOS could only ever generate findings about the marine environment, and the Tribunal had no mandate to pronounce on the atmosphere, terrestrial ecosystems, or human rights as such. This reflects institutional design rather than any greater analytical caution on ITLOS's part. On the question the two bodies share — the classification of GHG emissions as pollution and the stringency of the resulting due-diligence standard — the ICJ reached substantially the same conclusion as ITLOS, and it did so by expressly ascribing weight to ITLOS's reasoning: the Court stated that, while 'not obliged, in the exercise of its judicial functions, to model its own interpretation of UNCLOS on that of ITLOS', it would nonetheless 'ascribe great weight' to the Tribunal's interpretation of the Convention, in order to promote consistency and legal certainty in the law of the sea.[141] In formal terms, the ITLOS Opinion is not binding on the ICJ, and its authority before the Court is properly described as persuasive rather than binding; what the Court's treatment suggests is closer to derivative reasoning — the Court adopted the substance of ITLOS's interpretation while formally preserving its own independent authority to have read UNCLOS differently had it seen fit to do so. The practical implication is that ITLOS's narrowness should not be read as doctrinal weakness: within its own domain it remains the more specific, more textually grounded authority, and a future claim concerning the marine environment specifically would be better argued from ITLOS's reasoning directly than from the ICJ's later, derivative adoption of it.

The ICJ is broader chiefly because the General Assembly's request was itself broader, asking the Court to identify States' obligations under the whole of applicable international law, including human rights law, and to address the legal consequences of breach — a remedial question ITLOS was never asked. This breadth comes at a cost: because the ICJ was synthesising several distinct bodies of law within a single Opinion, its treatment of any one of them, including the law of the sea, is necessarily less granular than that of a tribunal dedicated to that body of law alone. On this

141 ICJ, Climate Change Advisory Opinion (n 80) para 338.

view, the Court's UNCLOS analysis is authoritative substantially because it draws on ITLOS's reasoning, rather than because it independently develops that reasoning further.

Assessed against the interests of future generations specifically, the ICJ Opinion is the more useful of the two, but not because it is more authoritative on any individual point of law. It is more useful because the harms future generations will face from climate change are not confined to the marine environment, and only the ICJ Opinion supplies a legal framework — spanning treaty law, custom, the law of the sea and human rights — broad enough to address that fuller range of harms within a single, mutually reinforcing analysis. The ITLOS Opinion remains indispensable within that broader framework for one specific purpose: it is the more precise and more directly applicable authority wherever a future claim concerns the marine environment specifically, and its capacity-scaled, stringent due-diligence standard is stated with a precision the ICJ's more synthetic treatment does not attempt to match. The two Opinions are accordingly complementary rather than competing sources of protection, and treating either alone as sufficient would understate what international law, read as a whole, now requires.

Three gaps survive the combined effect of both Opinions, each bearing directly on future generations. First, neither Opinion specifies the operational content of 'stringent' due diligence in a way that removes the need for further, case-specific litigation. Second, neither Opinion creates standing for future generations, or for any present actor specifically representing their interests as such; both remain dependent on present States or, in the human-rights context examined in section 4.4, present associations and communities choosing to invoke the obligations the Opinions describe. Third, neither Opinion resolves the evidentiary difficulty of attributing a specific future harm to a specific present State's conduct — a difficulty examined further in section 4.6, and one that seems likely to grow more, rather than less, acute as the harms in question recede further into the future.

4.5.1 Convergence on Prevention, Science and Long-Term Risk

Read together, ITLOS and the ICJ reveal a notable convergence. Both treat climate change as a problem to which existing international legal obligations apply; both give substantial weight to scientific knowledge; and both understand due diligence as responsive to the seriousness of environmental risk. The ICJ additionally situates intergenerational equity within the interpretive

framework of climate obligations and confirms the continued relevance of customary international law alongside the climate treaties.

This convergence matters because it reduces doctrinal fragmentation. A State's climate conduct may simultaneously engage treaty obligations, customary prevention and cooperation, law-of-the-sea duties and human-rights obligations. The existence of multiple legal bases does not mean that every breach will be easy to prove, but it makes it more difficult to characterise climate protection as merely discretionary policy. For future generations, the legal significance is that long-term climate risk increasingly forms part of the present standard against which State conduct can be assessed.

4.6 Critical Assessment: Doctrinal Advances and Remaining Gaps

The two Advisory Opinions examined in this chapter represent genuine doctrinal advances, but doctrinal advance is not the same thing as institutional transformation. This section examines three structural limitations that qualify both Opinions and that bear directly on the adequacy criteria set out in Chapter 1, before drawing the two Opinions' shared operational limit together in a final synthesising point.

Neither Opinion is legally binding in the manner of a contentious judgment. Advisory opinions are rendered at the request of an international organ, involve no parties to a dispute, and lack the *res judicata* effect of a judgment under Article 59 of the ICJ Statute.[142] This constraint must nonetheless be read in context: the authority of an advisory opinion stems not from coercive enforcement but from the institutional standing of the body that issued it and the persuasiveness of its reasoning, and there is no intrinsic difference in the quality of legal reasoning between an advisory opinion and a contentious judgment — both represent authoritative legal pronouncements by the same institution applying the same sources of international law.[143] Historically, the ICJ's advisory opinions in *Reparations for Injuries* (1949), *Namibia* (1971), *Nuclear Weapons* (1996), and the *Wall in the Occupied Palestinian Territory* (2004) had a considerable impact on subsequent international legal discourse and State practice, despite the absence of direct

142 Statute of the International Court of Justice (adopted 26 June 1945, entered into force 24 October 1945) 33 UNTS 993, art 59.

143 Acquaviva; Mayr and Mayr-Singer; Rezadoos, cited in the Bibliography.

enforcement tools;[144] section 4.7 below considers the contemporary evidence that a comparable dynamic is under way for the ICJ's 2025 Opinion. What political endorsement cannot supply, for either Opinion, is compulsory jurisdiction or a direct remedial procedure.

Causation presents a second, distinct problem — and in some ways a more intractable one, for the ICJ Opinion specifically, since ITLOS was never asked to address legal consequences or remedy. The Court acknowledged the enormous challenge of demonstrating that specific climate-related losses incurred in one State can be linked to the emissions of another, a difficulty that derives from greenhouse gas pollution's inherent global, cumulative, and diffuse nature.[145] As climate-attribution research has repeatedly demonstrated, uncertainties accrue at every point of the causal chain, from emissions to atmospheric concentrations, global temperature increases, regional climatic effects, and, finally, concrete economic and social losses.[146] Causation for reparation must, however, be distinguished from the entitlement to invoke responsibility: a State may breach a preventive due-diligence obligation even where an affected State later faces difficulty quantifying the causal contribution of that breach to a particular loss. The 2025 Advisory Opinion materially strengthens an alternative route around this problem by characterising obligations to protect the climate system as obligations *erga omnes*, and core treaty obligations under the climate regime as obligations *erga omnes partes* — a characterisation that permits States other than a specially injured State to invoke responsibility for breach, subject to the applicable jurisdictional and admissibility requirements, without removing the need to establish causation where compensation for a specific injury is sought.[147]

A further, and arguably more fundamental, limitation concerns representation. Neither Opinion creates a mechanism for the direct procedural representation of future generations; their interests can reach international adjudicative bodies only through existing States or institutions with procedural capacity.[148] This is not a problem unique to persons not yet born, since individuals

144 Mayr and Mayr-Singer; Stoeger, cited in the Bibliography.
145 ICJ, Climate Change Advisory Opinion (n 80).
146 Callahan and Mankin, 'National Attribution of Historical Climate Damages' (2022) 117(2) Climatic Change 40.
147 ICJ, Climate Change Advisory Opinion (n 80).
148 Bustami; Lawrence and Kohler, cited in the Bibliography.

generally cannot appear as parties before the ICJ or ITLOS; the specifically intergenerational difficulty is that future interests depend entirely on present actors choosing to represent them, a constraint that reflects the largely State-centric structure of the international legal system itself.[149] The result, across both Opinions and the human-rights jurisprudence examined in section 4.4, is an indirect form of protection rather than a complete absence of procedural routes: future generations cannot appear as parties, but their interests may be advanced by States invoking obligations *erga omnes* or *erga omnes partes*, by present individuals and communities before regional human-rights courts and UN treaty bodies, and through public-interest or representative litigation in the domestic and regional systems that permit it. These routes remain imperfect because unborn persons cannot determine whether a claim is brought, how it is framed, or what remedy is sought. The representation gap is therefore real, but it should be described as a deficit in stable and direct representation, not as a total absence of legal pathways.

A final point draws the two Opinions together rather than treating them separately. Both due-diligence standards examined in this chapter — the ICJ's general standard, calibrated to the 1.5°C benchmark and the best available science, and ITLOS's stringent, capacity-scaled standard under Article 194 — share the same structural limitation: each fixes that a demanding standard applies without specifying, in operational terms, what that standard concretely requires of any particular State's regulatory conduct. This is not a defect unique to either Tribunal; it follows from the nature of due diligence as an obligation of conduct rather than result, which necessarily leaves its content to be worked out against the facts of individual cases. The practical consequence, common to both Opinions, is that the clarity they supply is doctrinal rather than operational: it is now considerably harder for a State to argue that no demanding standard applies, but considerably easier for a State to dispute, in any given case, whether its own conduct satisfied whatever that standard turns out to require.

4.7 Institutional Reception: The 2026 UNGA Follow-up Resolution

The limitations examined in section 4.6 do not exhaust the significance of the ICJ's Advisory Opinion. Alongside them must be placed a development that points in a different direction: the

[149] See Bustami; Gallarati, cited in the Bibliography.

General Assembly's formal institutional reception of the Opinion, which suggests that its influence is already being felt beyond the courtroom.

On 20 May 2026, the General Assembly adopted Resolution 80/263, entitled Advisory opinion of the International Court of Justice on the obligations of States in respect of climate change, based on draft resolution A/80/L.65. The text welcomes the Court's Opinion and reflects a broad institutional response to the legal framework clarified by the Court. The recorded vote — 141 in favour, 8 against and 28 abstentions — shows that the Opinion received substantial support within the General Assembly, even though a small group of States opposed the follow-up resolution.[150] No comparable General Assembly resolution has, to date, welcomed the ITLOS Opinion specifically, which is a genuine asymmetry between the two Opinions' institutional reception, consistent with the difference in institutional breadth identified in section 4.5: a request co-sponsored by 132 States and addressed to the United Nations' principal judicial organ appears, on the evidence available, to generate a different order of political follow-up than a request confined to the law of the sea and addressed to a specialised tribunal, whatever the underlying legal merit of each Opinion.

The significance of Resolution 80/263 lies less in the creation of new legal obligations than in the institutional reception of the Advisory Opinion. It does not convert the Opinion into a binding judgment, and it does not itself create treaty obligations; its importance is rather that it treats the Court's reasoning as an authoritative reference point for subsequent multilateral action, moving the Opinion from judicial clarification towards political and institutional implementation, particularly in relation to mitigation, adaptation, cooperation and the legal consequences of climate harm.

For this thesis, the resolution supports the argument that the protection of present and future generations is gradually becoming more concrete in international legal discourse. At the same time, it confirms that the central problem is no longer only whether international law recognises duties connected to climate change — both Advisory Opinions, and the human-rights jurisprudence examined in section 4.4, now place that recognition beyond serious doctrinal dispute — but

[150]UNGA Res 80/263 (20 May 2026) UN Doc A/RES/80/263; United Nations, 'General Assembly Strengthens Fight against Climate Change, Adopting Resolution Welcoming International Court of Justice Advisory Opinion' GA/12760 (20 May 2026).

whether those duties can be translated into effective compliance and enforcement mechanisms. Political endorsement can strengthen the authority and visibility of the Court's reasoning, but it cannot by itself supply the compulsory jurisdiction, standing, or remedial machinery that would be needed to enforce intergenerational climate obligations directly. The continuing dependence of future generations on present States and international institutions for representation remains, in this respect, the defining structural challenge carried forward into the conclusions and reform proposals of Sections 4.8 and 4.9.

4.8 Conclusions from the Analysis

4.8.1 Answering the Research Question

The central question of this thesis was whether existing international environmental law adequately protects the interests of future generations and, where it does not, what legal mechanisms could narrow the gap between intergenerational equity and enforceable obligations. The answer is not a simple yes or no. Protection exists, but it is uneven and incomplete. Measured against the four criteria used throughout the thesis—(1) binding force and legal status, (2) precision of the applicable standard, (3) monitoring, compliance, responsibility and remedy, and (4) representation of future generations' interests—the position is as follows. Binding obligations relevant to future generations do exist, particularly through prevention and due diligence, the no-harm rule, treaty duties, and related human-rights obligations. Their precision has improved through recent judicial interpretation, but remains uneven across environmental regimes. Enforcement is still constrained by consent-based jurisdiction and facilitative compliance mechanisms, although the *erga omnes* and *erga omnes partes* character of important climate obligations broadens the class of States that may invoke responsibility. Representation remains the weakest element: future interests normally reach international institutions indirectly through States, current right-holders or public-interest actors rather than through a stable representative of future generations. The first hypothesis is therefore partly confirmed. References to future generations are often aspirational, but they can also shape the interpretation of binding treaty and customary obligations. The second hypothesis is strongly confirmed: weak enforcement and the absence of stable representation prevent those obligations from providing dependable protection. The third hypothesis is confirmed in a limited sense. The ITLOS and ICJ advisory opinions have

made existing duties clearer and more usable, but they have not removed the institutional conditions that produced the enforcement deficit.

4.8.2 The Adequacy Gap

The weaknesses identified in the thesis fall into two broad categories. The substantive gap concerns binding force and precision: what does the law require, and how clearly does it say so? The institutional gap concerns enforcement and representation: who can invoke the obligation, before which body, and with what consequence? Keeping the two categories separate matters because stronger treaty language cannot by itself solve the absence of procedures, while new procedures cannot compensate for obligations that remain too vague to apply. At the substantive level, the analysis in Chapter 3 revealed a consistent pattern: international environmental instruments invoke future generations as beneficiaries of the obligations they establish, but rarely specify the content of those obligations with the precision necessary to make them judicially enforceable. The Paris Agreement commits States to ambitious long-term temperature goals but entrusts the determination of the contribution each State will make to achieving those goals to a self-differentiated, nationally designed process whose outputs are reviewed for procedural but not substantive adequacy. The CBD affirms conservation for the benefit of future generations but provides no mechanism through which future generations' representatives could challenge a State's biodiversity strategy as inadequate. UNCLOS imposes a general obligation to protect and preserve the marine environment but leaves the specific measures required to prevent climate-related ocean harm to States' own assessment of their due diligence obligations.[151] This pattern reflects the way international environmental rules are negotiated. States can often agree on broad principles more easily than on detailed standards, independent review, or legal responsibility for non-compliance. The result is not a body of law without value: general principles can guide interpretation and influence policy. The difficulty is that their effect is less predictable when the relevant obligations, benchmarks, and consequences are not set out with enough precision. At the institutional level, the analysis in Chapters 3 and 4 identifies a representation deficit rather than a complete procedural vacuum. Future generations have no direct standing before international courts, but long-term interests can enter legal proceedings through several existing routes: States

[151]Philippe Sands and Jacqueline Peel, *Principles of International Environmental Law* (4th edn, Cambridge University Press 2018).

may invoke obligations of an *erga omnes* or *erga omnes partes* character; present individuals and communities may use regional human-rights courts and UN treaty bodies; and public-interest or representative litigation can, in systems that permit it, challenge State conduct whose consequences extend beyond the present generation. These routes are valuable but contingent. They depend on present actors choosing to litigate, on admissibility and jurisdictional rules, and on remedies designed primarily for present claimants. Fragmented environmental governance and the temporal mismatch between political cycles and multigenerational harm compound that problem.[152]

4.8.3 The Enforcement Deficit

The adequacy gap persists, in part, because the enforcement machinery is inadequate to the task. Where international environmental law has generated substantive obligations that could, in principle, protect future generations, the compliance mechanisms available to give those obligations effect are characteristically weak, fragmented, and dependent on the voluntary cooperation of the States whose conduct is in question. As Dupuy and Viñuales emphasise, international environmental law is characterised by a preference for facilitative compliance mechanisms over adversarial enforcement. Most multilateral environmental agreements rely on national reporting, peer review, technical assistance, and capacity-building rather than on formal dispute settlement, sanctions, or judicially supervised remedies.[153] This preference is understandable given the consensual basis of international law and the political realities of multilateral negotiations, but it has a direct cost: it means that a State whose environmental performance is inadequate faces, at most, political pressure and reputational consequences rather than legal liability. For obligations that are owed to persons who cannot assert their own interests before international tribunals, this limitation is particularly acute. The 2025 ICJ Advisory Opinion has begun to address the enforcement deficit in important ways. It clarified preventive and due-diligence obligations applicable to climate change, confirmed the application of the general law of State responsibility, and recognised the *erga omnes* or *erga omnes partes* character of important climate-protection obligations. That combination matters for enforcement because States other than a specially injured State may, in principle, have a legal interest in invoking responsibility for

[152]Daniel Bodansky, *The Art and Craft of International Environmental Law* (Harvard University Press 2010) 15–18.
[153]Dupuy P-M and Viñuales JE, *International Environmental Law* (2nd edn, Cambridge University Press 2018) 298–302.

breach, even though contentious jurisdiction before a particular court must still be established independently. The Opinion also reinforces human-rights pathways through which present applicants and communities may challenge climate inaction. Its contribution is therefore greater than simple clarification of NDC

procedure, but it does not remove the institutional limits of jurisdiction, admissibility, causation, remedy and representation.[154] The 2025 Advisory Opinion nevertheless remains subject to the limits of advisory procedure. It is not binding in the same way as a contentious judgment, does not establish a direct enforcement mechanism, and does not create a representative for future generations. Its main contribution is interpretive: it strengthens the legal basis on which present actors may challenge inadequate climate action, while leaving the wider institutional structure largely unchanged.

4.8.4 The Contribution of Recent Judicial Developments

It would be a mistake to allow the structural critique to obscure what the recent advisory opinions have actually done. The relevant cluster now includes the 2024 ITLOS Advisory Opinion, the 2025 ICJ Advisory Opinion, and the Inter-American Court's 2025 Advisory Opinion OC-32/25 on the *Climate Emergency and Human Rights*, read against the foundation laid by OC-23/17. Together they represent a genuine doctrinal advance even though they fall short of the structural transformation that full intergenerational protection would require. To begin with, they have clarified the content of due diligence obligations in the specific context of climate change, providing authoritative guidance that goes well beyond the general formulations found in the UNFCCC and the Paris Agreement. By specifying that due diligence requires measures consistent with the best available science, that the applicable scientific standard is set by IPCC assessments, and that individual States cannot avoid their obligations by pointing to the collective nature of the climate problem, the opinions have given operational content to obligations that were previously too vague to enforce.[155] The opinions have also integrated human rights law and environmental law in a way that opens new avenues for intergenerational climate claims. By confirming that climate obligations must be interpreted in conjunction with international human rights instruments,

[154]International Court of Justice, *Obligations of States in respect of Climate Change* (Advisory Opinion, 23 July 2025) <https://www.icj-cij.org/node/205614> accessed 25 May 2026, paras 140–145, 162–172, 229–254 and 412–445.
[155]International Court of Justice (n 154), paras 136–138 and 280–300.

and that the *lex specialis* argument does not prevent human rights bodies from addressing climate-related claims, the opinions have made it possible for affected persons and communities to seek remedies through human rights mechanisms that were previously unavailable.[156]

A further contribution lies in how the long-term temperature goals of the Paris Agreement are treated: by reading them as a benchmark for assessing the adequacy of State conduct rather than merely an aspirational political target, the opinions have substantially narrowed the space within which States can argue that their climate policies are legally adequate while remaining consistent with emissions trajectories that exceed the 1.5°C or 2°C thresholds. This is a significant constraint on State discretion with important implications for domestic climate litigation. Perhaps most significantly for the long-term trajectory of international environmental law, the opinions have demonstrated that courts and tribunals are willing to address the intergenerational dimension of environmental obligations directly rather than treating it as a policy aspiration beyond the reach of legal analysis. The ICJ's willingness to engage with the question of what international law requires in respect of future generations, and to frame due diligence obligations in explicitly temporal terms, represents a doctrinal development whose implications will continue to unfold through subsequent litigation and treaty practice.

4.9 Reform Proposals

The preceding analysis establishes that while recent judicial developments have narrowed the adequacy gap and strengthened the legal framework for intergenerational protection, the structural deficiencies identified in the enforcement deficit cannot be resolved through judicial creativity alone. They require institutional and normative reform. The following proposals are not offered as a comprehensive reform programme — that would require a different kind of study. They are offered as analytically grounded directions, each of which is compatible with the existing treaty and institutional framework and each of which addresses a specific deficiency identified in the analysis.

[156]International Court of Justice (n 154), paras 140–145 and 162–172.

4.9.1 Stronger Treaty Obligations with Intergenerational Content

The most fundamental reform needed is the incorporation of substantive intergenerational obligations into operative treaty provisions rather than merely aspirational preambles. This would require negotiating States to agree not only that future generations are beneficiaries of the environmental protection their treaties establish, but that this status generates specific obligations: to conduct intergenerational impact assessments before authorising activities with long-term environmental consequences, to maintain environmental quality within defined thresholds over specified time horizons, and to give legal effect to the precautionary principle in a form that restricts the permissibility of activities whose long-term effects are uncertain but potentially irreversible.[157] In terms of legal form, such obligations would most appropriately take the structure of obligations of conduct rather than obligations of result. An obligation of result — requiring States to guarantee that global temperatures do not exceed 1.5°C, for example — is neither legally realistic nor consistent with the due diligence framework that the 2025 ICJ Advisory Opinion confirmed applies in the climate context. An obligation of conduct, by contrast, would require each State to take all measures consistent with the best available science and with its capacities to prevent foreseeable intergenerational harm — a formulation that is operationally specific without being impossibly demanding. The enforcement mechanism for such obligations should, at a minimum, include independent scientific review of compliance by a treaty body with the authority to issue binding findings of inadequacy, and should provide for reporting obligations triggered not only by the current period of a State's NDC but by its long- term emission trajectory as projected over at least a fifty-year horizon. The practical obstacles to such an approach should not be underestimated. Major emitting States have consistently resisted the incorporation of binding substantive obligations into climate agreements, preferring the flexibility of nationally determined contributions over externally specified targets. Incorporating explicit intergenerational obligations would require either overcoming this resistance or designing obligation structures that are substantively meaningful while remaining flexible enough to attract broad adherence. Neither is easy, but both are more achievable in the wake of the 2025 ICJ Advisory Opinion, which has provided authoritative confirmation that States already bear due diligence obligations calibrated to the long-term interests of future generations under existing international law.

[157] Weiss (n 19) 619–621; Bustami (n 20) 268–271; Gallarati (n 21) 78–82.

4.9.2 A UN Special Envoy or Commissioner for Future Generations

The 2021 *Our Common Agenda* report of the UN Secretary-General proposed the establishment of a Special Envoy for Future Generations at the United Nations level. This proposal was subsequently reflected in the 2024 Pact for the Future and the annexed Declaration on Future Generations.[158] The establishment of such an office would represent a meaningful, if modest, step towards institutional representation of future generations' interests in international governance.

A properly resourced and mandated Envoy or Commissioner could perform several functions relevant to the enforcement gap. It could participate as *amicus curiae* in international proceedings where future generations' interests are at stake, providing advocacy for intergenerational perspectives that current procedural rules do not accommodate. It could conduct regular assessments of the intergenerational adequacy of major international environmental agreements, publishing findings that could inform treaty body reviews and political debate. It could facilitate the integration of intergenerational concerns into the design of national climate and biodiversity strategies. And it could serve as a focal point for the growing network of national and subnational future generations commissioners whose institutional experience could inform the development of international models. The limitations of such an office should also be acknowledged candidly. An envoy without enforcement powers, independent funding, or access to formal legal proceedings would be largely dependent on political influence and moral authority. Experience with comparable offices — including the UN Special Rapporteur on Human Rights and the Environment, whose mandate has grown significantly in recent years — suggests that such bodies can exercise genuine influence on the development of norms and the conduct of States, but that their effectiveness is constrained by the political context in which they operate and the willingness of member States to take their findings seriously.[159]

4.9.3 Intergenerational Impact Assessment

Environmental impact assessment is already an established procedural requirement under international environmental law, confirmed by the ICJ as part of the due diligence standard

[158]UNGA Res 79/1, Pact for the Future (22 September 2024) UN Doc A/RES/79/1, annex II (Declaration on Future Generations).

[159]John H Knox, 'Report of the Special Rapporteur on the Issue of Human Rights Obligations Relating to the Enjoyment of a Safe, Clean, Healthy and Sustainable Environment' (24 January 2019) UN Doc A/HRC/40/55.

applicable to activities with potentially significant transboundary effects. Extending this requirement to encompass intergenerational impact assessment — requiring States to assess and disclose the long-term consequences of major policy decisions for future generations before those decisions are taken — would give practical procedural effect to the normative commitment to intergenerational equity without requiring the fundamental renegotiation of substantive treaty obligations. Such a requirement would be most effective if it applied not only to specific projects but to national climate strategies and biodiversity plans. A requirement that States demonstrate, as part of the NDC process, that their emission reduction trajectories are consistent with the long-term temperature goals of the Paris Agreement and with their due diligence obligations under the 2025 ICJ Advisory Opinion would operationalise the Court's holdings in a way that goes beyond individual dispute resolution. It would create a systematic mechanism for assessing whether States' own self-determined contributions are adequate to protect the interests of future generations, addressing the self-differentiation gap in the Paris Agreement architecture.

4.9.4 Treaty-Based Standing and Representation Mechanisms

The most structurally significant reform — and the most politically challenging — would be the development of treaty-based mechanisms through which future generations' interests could be directly represented in international legal proceedings and compliance processes. Several models are available from national and regional practice. The Welsh Future Generations Commissioner, established under the Well-being of Future Generations (Wales) Act 2015, has a statutory mandate to monitor and report on the way Welsh public bodies pursue the well-being goals of the Act, including environmental resilience and climate-related objectives. The Hungarian institutional experience provides another national model. Adapted to the international level, a comparable office could submit assessments to treaty bodies and compliance committees, request information, and draw attention to policies whose long-term effects have not been adequately considered. At the level of international dispute settlement, treaty amendments permitting the submission of *amicus curiae* briefs by recognised representatives of future generations' interests — including civil society organisations, youth movements, and designated institutional advocates — would partially address the representation gap without requiring the more fundamental restructuring of international legal personality. Such mechanisms have been developed in international investment arbitration and in the practice of several regional human rights bodies, and their extension to

environmental proceedings would be legally possible, although politically and institutionally demanding.[160]

4.9.5 Strengthened Compliance and Reporting Mechanisms

Beyond the reform of standing rules, the compliance mechanisms of major environmental agreements should be strengthened to give more explicit attention to intergenerational adequacy. The Paris Agreement's global stocktake mechanism — which assesses collective progress towards the Agreement's goals every five years — provides a structural foundation for this reform. Strengthening the stocktake to include an assessment of the adequacy of current emission trajectories for the protection of future generations, drawing on the IPCC's long-term projections, would operationalise the intergenerational dimension of States' climate obligations within the Agreement's existing architecture. Similarly, the compliance committees of environmental agreements could be given expanded mandates to consider submissions from recognised civil society and youth organisations asserting that a State's performance is inadequate from an intergenerational perspective. The Aarhus Convention Compliance Committee, which allows civil society organisations to submit communications concerning States' compliance with their procedural environmental obligations, provides a partial model. Extending the scope of such mechanisms to encompass substantive intergenerational obligations would require treaty amendments but is conceptually consistent with the evolving role of compliance bodies in international environmental governance.

4.9.6 Stronger Use of Due Diligence and Best Available Science

Perhaps the most immediately actionable reform is the consistent application, in both international adjudication and domestic climate litigation, of the due diligence standard clarified by the 2025 ICJ Advisory Opinion. The Court confirmed that States are required to take measures consistent with the best available science — as represented by IPCC assessments — to prevent, reduce and control their contribution to climate change.[161] This standard provides a legal benchmark against which the adequacy of States' climate policies can be assessed without requiring the renegotiation of treaty obligations. Domestic courts have increasingly applied analogous standards in climate

[160]Gallarati F, 'Intergenerational Justice from Theory to Practice: The Rights of Future (and Present) Generations in Climate Litigation' (2024) 2 Italian Papers on Federalism 56, 73–75.
[161]International Court of Justice (n 154), paras 280–300.

litigation. The success of the *Urgenda* litigation in the Netherlands and the German Constitutional Court's climate order demonstrates that courts are willing and able to assess the adequacy of States' climate commitments against scientific benchmarks and legal standards, and comparable reasoning has begun to appear in climate-related litigation in other jurisdictions, though the doctrinal reception of these standards outside the Netherlands and Germany remains uneven and is not examined in detail in this thesis. The ICJ Advisory Opinion strengthens the normative foundation for this litigation by providing authoritative confirmation of the applicable due diligence standard, which national courts can invoke when assessing whether domestic climate policies are consistent with international law.[162]

4.9.7 Intergenerational Review as an Integrated Reform Model

The reform proposals considered above are most effective when understood as parts of an integrated model rather than isolated institutional innovations. Intergenerational impact assessment can generate information, but information alone is insufficient if no institution is responsible for scrutinising it. A commissioner or special envoy can provide representation, but representation will remain weak if there are no substantive standards against which policies can be assessed. Stronger reporting and compliance procedures can improve transparency, but they require scientifically grounded benchmarks and a clear account of due diligence.

An integrated model would therefore connect four functions: foresight, representation, review and accountability. Foresight identifies long-term environmental consequences using the best available science; representation ensures that those consequences are not discounted simply because the persons most affected are absent from present decision-making; review tests policies against applicable treaty and customary obligations; and accountability requires States to explain, report and where appropriate remedy failures to meet those standards. The 2024 Declaration on Future Generations provides political and institutional support for several of these functions, while the 2024 ITLOS and 2025 ICJ advisory opinions strengthen their legal foundation in the climate field.

Such a model would not require international law to resolve every philosophical problem concerning the rights of unborn persons. Its advantage is institutional modesty: it begins with

[162] *State of the Netherlands v Urgenda Foundation*, Supreme Court of the Netherlands, 20 December 2019, ECLI:NL:HR:2019:2007; Bundesverfassungsgericht, Order of 24 March 2021, 1 BvR 2656/18.

obligations and procedures already recognizable within international law and asks how they can be applied consistently over longer time horizons. This makes reform both more legally plausible and more closely connected to the doctrinal developments examined throughout the thesis.

4.10 General Conclusion and Final Reflections

The question with which this thesis began asked whether existing international environmental law adequately protects the interests of future generations and, where it does not, what legal mechanisms might close the gap between intergenerational equity and enforceable obligation. The answer that emerges from the preceding chapters resists compression into either a confirmation or a denial. Protection exists, and it is neither nominal nor merely rhetorical: it is built into binding treaty commitments, customary rules of prevention and due diligence, and, increasingly, human-rights obligations relevant to environmental and climate harm. Yet that protection is uneven in its precision, dependent for its practical effect on actors other than those it is meant to benefit, and largely unaccompanied by institutions capable of supervising compliance on a timescale commensurate with the harm in question. Measured against the four criteria adopted in Chapter 1 — binding force, precision, monitorability and enforceability, and representation — international law satisfies the first two considerably better than the third, while representation remains the weakest element.

Intergenerational equity itself occupies a position more modest, and more useful, than either its critics or its most enthusiastic proponents tend to allow. Chapter 2 concluded, and nothing in the doctrinal or jurisprudential analysis that followed disturbed that conclusion, that intergenerational equity has not crystallised into an autonomous rule of customary international law capable of generating obligations independently of an underlying treaty or customary norm. What it has become, instead, is an interpretive principle of genuine legal consequence: a lens through which existing obligations of prevention, due diligence and cooperation may be read, and through which the temporal reach of a State's regulatory duties can extend beyond the interests of those currently alive. The recent climate advisory opinions reinforce the relevance of long-term risk, best available science and the consequences of present conduct for future generations, without recognising future generations as autonomous rights-holders with direct access to international adjudication. This distinction is central to the thesis: intergenerational equity does not operate here as a free-standing

source of new duties, but it can materially affect the interpretation and application of duties that already exist.

The substantive picture assembled in Chapter 3 confirms this reading. Sustainable development supplies an important doctrinal bridge through which intergenerational concerns enter treaty interpretation, while the no-harm rule and the associated duty of prevention perform more concrete work by regulating conduct that creates a risk of significant environmental harm. Due diligence gives that preventive obligation practical content by providing a standard against which the adequacy of present conduct can be assessed before damage has fully materialised. Precaution reinforces this structure where scientific uncertainty would otherwise permit delay, and environmental impact assessment gives it procedural form by requiring foreseeable environmental consequences to be identified and evaluated in advance. None of these doctrines was individually designed as a complete legal regime for future generations. Read together, however, they form a network of prevention-based obligations capable of reaching long-term and potentially irreversible harm.

Human-rights law extends this architecture without transforming its basic structure. The 2025 ICJ Advisory Opinion treated applicable human-rights obligations as part of the broader body of international law relevant to climate change rather than as displaced by the specialised climate treaty regime. The Inter-American Court's development from the environmental-rights framework of OC-23/17 to the climate-specific analysis of OC-32/25, together with the Committee on the Rights of the Child's reasoning in *Sacchi*, further demonstrates that climate-related harm can fall within the concerns of international human-rights institutions. What this jurisprudence adds is an additional legal route through which the consequences of environmental degradation for present persons, including children, can be assessed. It does not, however, create direct representation for persons not yet born. The international mechanisms examined in this thesis remain dependent on existing States, individuals, communities or institutions choosing to invoke the relevant procedures.

Against this background, the significance of the 2024 ITLOS and 2025 ICJ Advisory Opinions can be stated more precisely. ITLOS held that anthropogenic greenhouse-gas emissions can constitute pollution of the marine environment within the meaning of UNCLOS and that, under Article 194, paragraph 1, the applicable due-diligence standard in this context needs to be stringent.

The Tribunal also made clear that implementation may vary according to States' capabilities and available resources, while even States with fewer resources remain required to do what they can within those capabilities. It further treated the 1.5°C temperature goal and the best available science as relevant to identifying the necessary measures under UNCLOS. These findings gave more specific content to pre-existing obligations to prevent, reduce and control marine pollution from anthropogenic greenhouse-gas emissions.

The ICJ subsequently addressed a broader set of obligations. In relation to the Paris Agreement, the Court held that parties do not enjoy unfettered discretion in preparing their nationally determined contributions. It concluded that NDCs, taken together, must be capable of achieving the temperature goal of limiting global warming to 1.5°C above pre-industrial levels, and that the seriousness of the climate threat requires a stringent standard of due diligence in their preparation. The Court also recognised that the application of that standard varies in light of factors including historical contributions, development and national circumstances. In its interpretation of UNCLOS, the Court expressly stated that it should ascribe 'great weight' to ITLOS's interpretation of the Convention, while retaining its own judicial function. The relationship between the two Opinions is therefore best described as a significant convergence in the interpretation of overlapping obligations, rather than as proof that every aspect of the relevant standards is now finally settled.

What neither Opinion does is specify in advance what a stringent due-diligence standard requires of every State in every factual setting, resolve all evidentiary questions linking particular conduct to particular future harm, or create a representative capable of invoking those standards directly on behalf of persons not yet born. Their principal contribution for the purposes of this thesis is therefore doctrinal clarification. They make it more difficult to maintain that climate-related duties under international environmental law are too indeterminate to be assessed at all, but they do not remove the institutional and procedural limits that determine whether those duties can be monitored and enforced in practice.

The central finding that follows from reading the theoretical account of intergenerational equity, the substantive framework of international environmental law, and the recent jurisprudence together is that international law is not devoid of protection for future generations. The protection it supplies is nevertheless fragmented across regimes, indirect in its dependence on present legal

actors, and institutionally incomplete in its capacity to monitor, review and enforce what it requires. The recent advisory opinions narrow part of the adequacy gap by improving the precision of relevant obligations. They do not close the separate gaps of enforcement and representation. This distinction between the existence of a substantive obligation, its interpretation through intergenerational considerations, the procedures available to invoke it, the institutional question of representation, and the separate problem of enforcement is essential to the overall conclusion of the thesis.

It is this pattern that supports the reforms proposed in this chapter. Intergenerational impact assessment would extend the anticipatory logic already present in environmental assessment to policy and legislative choices with substantial long-term consequences. A commissioner or envoy for future generations would respond to the representation deficit without purporting to confer legal personality or direct standing on the unborn. Strengthened monitoring, reporting and compliance mechanisms would address the enforcement deficit by increasing the likelihood that inadequate implementation is identified before environmental harm becomes irreversible. These proposals do not depend on treating intergenerational equity as an autonomous binding rule, nor do they require the wholesale replacement of existing treaty regimes. Each responds to a distinct weakness identified by the analysis.

Underlying these proposals is a distinction that has remained important throughout the thesis: normative development is not the same as effective implementation, and judicial clarification cannot substitute for institutions capable of sustained monitoring and review. International courts and tribunals can clarify the content of due diligence, prevention and cooperation; they cannot continuously supervise the domestic implementation of those obligations across decades. Human-rights bodies can clarify the application of existing rights to environmental and climate harm; they cannot by themselves create direct representation for future persons. The institutional limits of adjudication therefore explain why the reforms proposed here focus on procedures, representation and compliance rather than expecting further judicial interpretation alone to close the remaining gap.

The trajectory traced across this thesis — from a theoretical concept of contested legal status, through a substantive framework that reaches future harm by regulating present conduct, to recent advisory opinions that have clarified the content of several relevant obligations — suggests that

international environmental law is developing on the question of future generations while remaining incomplete. Its evolution has occurred less through the recognition of future persons as new rights-holders than through the progressive specification of the standards by which present conduct is judged. The legal materials necessary to justify stronger intergenerational institutions therefore already exist to a significant degree. The remaining question is whether States and international institutions will translate that normative foundation into procedures capable of representing long-term interests, monitoring compliance and responding before irreversible harm occurs.

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