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The International Climate Change Regime and the Growth-Oriented Ontology of Sustainable Development: A System on Shaky Foundations

Abstract: This research examines the international climate change regime, critically assessing the extent to which it is underpinned by the growth-oriented, mainstream conceptualization of sustainable development. The study first outlines the shortcomings characterizing the concept of sustainable development, as well as differences which exist between its mainstream and more progressive conceptualizations. Subsequently, it adopts a post-sustainable-development perspective to identify elements within the international climate change regime that reflect and normalize the mainstream conceptualization of sustainable development. Although climate change treaties “shall be based on best available scientific knowledge,” the literature reveals that mainstream sustainable development ontology is built upon shaky assumptions, including the feasibility of decoupling global economic growth from ecological pressures. Nonetheless, the three climate change treaties have increasingly been influenced by the mainstream conceptualization of sustainable development, thereby legitimizing and crystallizing its underlying assumptions. This article advocates for a scientifically grounded reconceptualization of sustainable development, or a complete replacement of the concept with ecologically centered alternatives.

Keywords: UNFCCC, Kyoto Protocol, Paris Agreement, ICJ advisory opinion, sustainable development, post-sustainable development perspective, post-growth

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—*Worse than a system which does not recognize the need to take climate action might be a system which pretends to take climate action but actually just takes time.*

I. Introduction: The International Climate Change Regime and the Concept of Sustainable Development—A Problematic Relationship

The emergence of the United Nations Framework Convention on Climate Change (UNFCCC), the establishment of two treaties aimed at implementing it (that is, the Kyoto Protocol and the Paris Agreement), and thirty Conferences of the Parties have not been sufficient to achieve the core, actually not very ambitious, objective of the over thirty-year-old UNFCCC: “the stabilization of greenhouse gas concentrations in the atmosphere.”¹ Acknowledging that a wide range of factors of a political, economic, and technical nature contribute to hindering the stabilization of anthropogenic greenhouse gas (GHG) emissions in the atmosphere, this article will focus on an internal limitation of the international climate change regime that has not yet been sufficiently addressed by legal scholars: its reliance on a mainstream, growth-oriented understanding of sustainable development.

As elucidated in the next section, the intricacies of sustainable development extend beyond its ambiguous legal standing, elusive definition, and convoluted historical evolution. More significant still is the mainstream reliance on an ontology that, lacking scientific substantiation, portrays the relationship between development (understood as economic growth) and environmental and social protection as inherently synergistic. This framing risks making it impossible for any institution premised on sustainable development—or any political, judicial, or private actor relying on its representation of reality—to achieve the environmental, social, and economic objectives it purports to advance. As this article will illustrate, far from being based on best available scientific knowledge, “sustainable development” is the product of a culture that maintains and spreads specific values, underpinning a distinctive economic, political, and social system (Castro 2003), in the name of “a new era of economic growth” (World Commission on Environment and Development 1987, 24). While it is not surprising that legal structures reflect the interests of the political actors who shape them (Cohen 1927; Harris 1993), when this tendency extends to climate treaties, the scale of the risk involved reaches an unprecedented magnitude (see, for instance, IPCC 2022).

Multiple interpretations of sustainable development have emerged over time. While more progressive interpretations remain incomplete, as they fail to incorporate the element of *ecological primacy*, the mainstream, growth-oriented understanding of sustainable development has been extensively critiqued across a broad range of scholarship for lacking scientific grounding and for functioning as a platform that legitimizes neoliberal and extractive projects (Tulloch 2013; Purvis, Mao, and Robinson 2018; Hickel 2019; Telleria and Garcia-Arias 2022; Kotzé and Adelman 2023; Talenti 2024; Saito 2024).²

¹ United Nations Framework Convention on Climate Change, art. 2, May 9, 1992, 1771 U.N.T.S. 107 (UNFCCC).

² Neoliberalism is understood as a political and economic doctrine that took shape after World War II, largely influenced by economists like Friedrich Hayek and Milton Friedman. Building upon liberal ideals, neoliberalism extends the view of humans as rational actors who, by pursuing their self-interests, purportedly contribute to societal good. It advocates for minimal state intervention in markets, widespread privatization of services, and the imposition

Building on this, the article posits that reliance of the international climate change regime on the mainstream conceptualization of sustainable development would be inherently problematic as it would conflict with the regime's mandate, spelled out in the Paris Agreement, to rely on the best available scientific knowledge.³ Accordingly, the primary aim of this article is to examine the extent of this reliance within the international climate change regime. A comprehensive analysis of the entire climate change regime, however, would go beyond the reach of one research article. Therefore, this work will analyze the three major international climate change treaties: the UNFCCC, the Kyoto Protocol, and the Paris Agreement. These texts, owing to their remarkable influence on the establishment of the international climate change regime, will serve as representative proxies for the broader regime.

Part II will distinguish between mainstream and more progressive interpretations of sustainable development, and highlight some of the inherent shortcomings of the mainstream understanding. Next, the article analyzes the three international climate change treaties that form the backbone of the international climate change regime through a post-sustainable-development perspective. Part III identifies elements of these climate change treaties that reflect and normalize the mainstream conceptualization of sustainable development. Part IV will summarize and reflect upon the main results of the analysis.

This article argues that, although the mainstream conceptualization of sustainable development can hardly be regarded as grounded in the best available scientific knowledge concerning the relationship between economic systems and ecosystems,⁴ climate change treaties have increasingly relied on this concept and its inherently weak assumptions. Indeed, these treaties have constantly increased the number of references to sustainable development and elevated its role within the regime's architecture, normalizing and justifying reliance on the ontology of mainstream sustainable development.⁵

While treaty law has generally refrained from defining sustainable development, and case law has at times offered more progressive interpretations, the expression *mainstream conceptualization of sustainable development* refers here to the view—explicitly outlined in soft-law documents from the

of structural adjustment programs in less industrialized nations. It thus legitimizes and mystifies the role of markets as the central forum for determining how societal surplus shall be invested. Ultimately, neoliberalism provides a cover for the reliance on capitalist worldviews, treating both nature and human labor as exploitable commodities or as expropriable “others,” in the interest of the capital-owning class, itself bonded to capital's need for self-expansion. See Fraser (2022).

³ Because climate change constitutes a “common concern of humankind,” the international climate change regime recognizes the need to deliver the “response to the urgent threat of climate change on the basis of the best available scientific knowledge.” Paris Agreement to the United Nations Framework Convention on Climate Change, pmbl., Dec. 12, 2015, T.I.A.S. No. 16-1104. Unlike other regimes emerging from the Rio Earth Summit, such as the biodiversity protection regime, treaties constituting the climate change regime explicitly refer to “best available scientific knowledge.” See, for example, United Nations Framework Convention on Climate Change, May 9, 1992, 1771 U.N.T.S. 107; Paris Agreement, Dec. 12, 2015, T.I.A.S. No. 16-1104.

⁴ There are three approaches to identifying “best available scientific knowledge.” First, it can be found in the content of highly reputable journals, which are subject to rigorous peer review; second, it can be derived from reports by authoritative research bodies; and third, in the case of climate change, it can be based on IPCC reports. As Section II of this work will demonstrate, the concept of sustainable development, and the optimistic ontology characterizing its mainstream conceptualization in particular, has been openly challenged in both high-level scientific research published in leading journals and research conducted by authoritative research bodies. This places the concept of sustainable development, and specifically the ontology underpinning it, in sharp contrast to best available scientific knowledge. See Lima (2024).

⁵ By ontology, I mean the regime's foundational understanding and representation of reality.

Brundtland Report onward—that continued economic expansion is compatible with, or even essential to, the environmental protection and social well-being that sustainable development purports to deliver. This conceptualization is described as *mainstream* because, as Part II will show, it emerged through decades of negotiation among global political leaders and has become deeply embedded in the institutional discourse of international environmental governance. Its relevance is profound: The ontology it reflects not only reveals the dominant worldviews of its creators, but also marks the boundaries within which political action is taken and regulatory frameworks must be designed.

Consequently, to free the international climate change regime from this concept of sustainable development—or, at least, to overcome its current neoliberal, growth-oriented bias—is essential for the establishment of a legally coherent climate change regime that is effectively grounded in the best available scientific knowledge.⁶

II. The Concept of Sustainable Development

To provide a comprehensive analysis of the concept of sustainable development falls outside the scope of this article; journal articles and books have already been devoted to this kind of analysis (Du Pisani 2006; Bosselmann 2008; Caradonna 2014; Borowy 2014; Pieraccini and Novitz 2020). Instead, this section simply identifies seven features of the concept of sustainable development that undermine its conceptual soundness and cast doubt on the normative authority it is often accorded. These include: the concept's ambiguous legal status; the inherent tension between its constitutive elements—that is, sustainability and development; the dominance of the developmental, growth-oriented component over the ecologically bounded sustainability component; its vague and, over time, increasingly less eco-centered and more fragmented definition; its markedly anthropocentric approach, giving rise to hermeneutical injustice and onto-epistemological issues; the emergence of a mainstream conceptualization that aprioristically equates development with economic growth, portraying it as inherently beneficial—if not necessary—for eradicating poverty and alleviating ecological pressures, thus justifying the Global North's maintenance of extractivist, profit-driven practices as beneficial for both nature and social development; and a more progressive conceptualization that nevertheless fails to recognize the principle of ecological primacy, despite ecological sustainability being the enabling condition for both societal well-being and economic activity.

In light of the multiple shortcomings identified in this section, the concept of sustainable development can hardly be considered as a scientifically based, reliable concept. Therefore, while it would be difficult to apply *any* “sustainable development principle” in law, grounding the international climate change regime on the mainstream ontology of sustainable development would be inherently hazardous.

First, the legal status of sustainable development is ambiguous. Over time, sustainable development has been referred to as a concept, *Gabčíkovo-Nagymaros Project (Hung. v. Slov.)*, Judgment, 1997 I.C.J. 7 (Sept. 25), as an international legal principle (Sands 2003), as a narrative (Telleria and Garcia-Arias 2022), as an objective (Fracchia and Vernile 2022), and as a goal.⁷ This situation is problematic: the status of any concept is not a detail, especially when it comes to its application.

⁶ The term “scientifically grounded” refers to reliance on “best available scientific knowledge” (see note 4).

⁷ G.A. Res. 70/1, Transforming Our World: The 2030 Agenda for Sustainable Development, U.N. Doc. A/RES/70/1 (Sept. 25, 2015).

While legal principles “are potentially applicable to all members of the international community across the range of activities that they carry out” (Sands 2003, 231), goals should orient, in a nonbinding fashion, the actions of policymakers. Although this article does not provide an in-depth assessment of the legal status of sustainable development, it is worthwhile to briefly outline how academic discourse and legal practice have shaped its understanding over time.

While the Sofia Guiding Statements by the International Law Association observe that there is, in international case law, “a continued and genuine reluctance to formalize a distinctive legal status” for sustainable development, International Law Association, Resolution No. 7/2012, Statement 1, scholars such as Barral (2018) claim that sustainable development has become a principle of law. This position relies on the 2013 *Indus Waters Kishenganga Case*, in which the arbitral tribunal explicitly referred to sustainable development as a principle. *Indus Waters Kishenganga (Pak. v. India)*, Final Award, para. 450 (2013).⁸

In the ICJ’s July 2025 advisory opinion on the obligations of states respecting climate change, the Court identified the “principle of sustainable development” as a norm guiding both the interpretation of certain treaties and the determination of customary international law. *Obligations of States in Respect of Climate Change*, Advisory Opinion, 2025 I.C.J. (July 23). This strengthens the view that sustainable development now functions as a legal principle. Nonetheless, even in this landmark case, the Court offered no explanation of the principle’s content or its practical implications, rendering its recognition largely symbolic. This shortcoming is underscored in the separate opinion of Judge Xue, who stresses that the Court “should have seized this opportunity to give a full account of the imperatives” arising from the principle, and regrets that the Court only gives it “a nominal effect” without analyzing in which way it guides the interpretation and application of the climate change treaties. *Obligations of States in Respect of Climate Change*, 2025 I.C.J. (Separate Opinion of Judge Xue), para. 1.

On a similar note, Verschuuren (2016, 294), while advocating for the recognition of a sustainable development principle, acknowledges that it “does not in itself seem to play a major role in the case law that emerges from the various regional human rights instruments. This is particularly evident in jurisprudence of the European Court of Human Rights.” Verschuuren (*ibid.*, 292) observes that in the case law of the Court of Justice of the European Union (CJEU), “practically all cases have been decided by relying on more specific principles, such as the prevention principle and the precautionary principle.” This reliance is particularly striking given that one of the EU’s foundational treaties, the Treaty on the European Union, is among the few international agreements to explicitly reference the “principle of sustainable development,” albeit only in its preamble, thus leaving its legal status unresolved even at the regional level.⁹

⁸ However, Barral (2018, 4) also observes that the International Court of Justice (ICJ) has only referred to sustainable development as a concept, or, at best, as an objective, and concludes that, if sustainable development is to be considered a principle, “it may well represent the most abstract formulation of such legal principles.”

⁹ References to sustainable development in international treaties can be found, for example, in UNFCCC art. 3(4); Agreement on the European Economic Area pmbl., May 2, 1992, 1994 O.J. (L 1) 3; Consolidated Version of the Treaty on the Functioning of the European Union art. 11, Oct. 26, 2012, 2012 O.J. (C 326) 47; Convention on Biological Diversity art. 6, June 5, 1992, 1760 U.N.T.S. 79; United Nations Convention to Combat Desertification art. 1(a), June 17, 1994, 1954 U.N.T.S. 3; Energy Charter Treaty art. 19(1), Dec. 17, 1994, 2080 U.N.T.S. 95; Kyoto Protocol to the United Nations Framework Convention on Climate Change art. 2(1), Dec. 11, 1997, 2303 U.N.T.S. 162; Aarhus Convention art. 1, June 25, 1998, 2161 U.N.T.S. 447; Cartagena Protocol on Biosafety art. 1, Jan. 29, 2000, 2226 U.N.T.S. 208; Stockholm Convention on Persistent Organic Pollutants art. 7, May 22, 2001, 2256 U.N.T.S. 119; Minamata Convention on Mercury art. 1, Oct. 10, 2013, 3202 U.N.T.S. 1; and Paris Agreement art. 2(1), Dec. 12,

Second, an inner tension characterizes the concept of sustainable development, which can be traced to its dualistic nature. Sustainable development is composed of two elements, sustainability and development, which originated in very different contexts, and whose combination, some scholars argue, has been instrumental for the spread and legitimation of a peculiar economic and cultural paradigm—the neoliberal one. Discourses on sustainability originated in eighteenth-century scholarly works (von Carlowitz 1713), and have since revolved around the issue of natural resource scarcity, underlining the importance of respecting the “limits of the Earth” (Osborn 1953). By the end of the nineteenth century, a better understanding of the complex relationship between humans and nature—brought about, among other things, by the emergence of studies on ecology (Haeckel 1866)—drew the concept of sustainability closer to an ecocentric approach.¹⁰ Since the 1970s (Georgescu-Roegen 1971; *The Ecologist* 1972; Meadows, Meadows, Randers, and Behrens 1972; Schumacher 1973), the link between economic growth and rising environmental footprint has turned criticism of the growth-oriented nature of the global economic system into “the nub of the environmental predicament” (*The Ecologist* 1972, 2).

Conversely, development, as a successor to concepts like “progress,” “modernization,” and “civilization,” is based on a linear understanding of time and history, and it emerged from political discourses following the Second World War (Lorenzini 2019). The cold war was characterized by the emergence of competing narratives on development (*ibid.*), shaped by scholars from both highly industrialized and less industrialized states, as well as by international movements like the Third World Movement and the international social reform movement.¹¹ However, it was the US model of development that spread at the global level, through means including the resonance box of the United Nations.¹² The US development model assumed that eternal expansion in production and consumption patterns, to be achieved through market liberalization, capital investment, and industrialization, would allow “peoples of the world to achieve . . . peace, plenty, and freedom” (Truman [1949] 1964, 4). Unfortunately, this development framework was blind to any kind of environmental consideration, while assuming overall economic growth as a proxy for social wellbeing (in complete disregard, among other things, of distributive considerations). Moreover, during the 1970s the “failure of the Great Promise” enshrined in the US development narrative began to become apparent (Fromm 1976, 2).¹³

It was shortly after this crisis challenging the concept of development that the notion of sustainable development first emerged. While the 1972 Stockholm Declaration did not explicitly mention sustainable development, it “served as a springboard to rebrand the concept of development” (Talenti 2024, 85). The declaration introduced the idea that economic development, seen as economic growth, could address both social and environmental issues, establishing the basis for the mainstream conceptualization of sustainable development.¹⁴ The first explicit global reference

2015, T.I.A.S. No. 16-1104. Notably, while the EEA Agreement mentions sustainable development as a principle in its preamble, the UNFCCC uniquely incorporates it as a principle within the substantive treaty text.

¹⁰ The adoption of an ecocentric approach was popularized with the publication of Carson (1962).

¹¹ Particularly relevant conceptualizations of development emerge, for example, from Gandhi (1938); Wallerstein (1974); and Sen (1999). For non-Western critiques of the relationship between development and environmental protection as it has been normalized in international environmental law, see Mickelson (2015) and Dehm (2016).

¹² This was apparent since the adoption of UN General Assembly resolutions: G.A. Res. 1710 (XVI), Dec. 19, 1961; G.A. Res. 2029 (XX), Nov. 22, 1965; and G.A. Res. 41/128, Dec. 4, 1986.

¹³ According to Fromm (1976, 2), the “Great Promise of unlimited progress” failed because unrestricted satisfaction is not conducive to well-being, economic progress remained restricted to rich nations, and technical progress created ecological and nuclear dangers.

¹⁴ Declaration of the United Nations Conference on the Human Environment, June 16, 1972, U.N. Doc. A/CONF.48/14/Rev.1, 3, statement 4; princ. 9.

to sustainable development appeared in the 1980 IUCN World Conservation Strategy (IUCN 1980). However, it was the 1987 Brundtland Report that diffused the sustainable development concept at the UN level. Since then, sustainable development has remained at the core of UN agendas, as well as of supranational bodies, including UNEP, the World Bank, the OECD (Hickel and Kallis 2019), and the European Union.¹⁵ Sustainable development has thus become a core political priority, even though it combines two traditionally opposing elements (sustainability and development), leading Lorenzini to describe it as “the most famous oxymoron in the history of international relations” (Lorenzini 2019, 141).

Third, within the concept of sustainable development, the developmental element, typically conceived as economic growth, has traditionally overshadowed the sustainability one, with scholars as Bosselmann (2008) claiming that one of the main shortcomings of the Brundtland Report is its inability to center the environmental dimension. Instead, the Brundtland Report infuses the sustainable development concept with faith in the capacity of technology and social organization to transcend the absolute limits of human action on Earth. As the Report states, “[T]he concept of sustainable development does imply limits— not absolute limits but limitations imposed by the present state of technology[.] But technology and social organization can be both managed and improved to make way for a new era of economic growth” (World Commission on Environment and Development 1987, 24). Thus, sustainable development has taken much more from the optimistic and growth-oriented development narrative than from the sustainability narrative, leading scholars as Castro (2003, 197) to state that “sustainable development sounds suspiciously like plain old development.”

The *fourth* element characterizing the concept of sustainable development is its challenging definition. In its seminal definition, provided in the Brundtland Report, sustainable development is described as that kind of development which “meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development 1987, 24). However, while the Brundtland definition has been praised for adopting an intergenerational approach, it has also been criticized for its vagueness, particularly regarding what counts as *needs* (see, for example, Norgaard 1994; Castro 2004). The Report does not specify, for example, whether increases in fossil-fuel use, meat consumption, or GDP growth represent genuine needs of current generations or merely the preferences of certain segments of them. Nor does it provide guidance on how to balance the needs of present and future generations: for example, whether current growth trajectories can remain viable for generations to come. As a result, the Brundtland definition of sustainable development remains conceptually ambiguous and difficult to operationalize.

The definitional issue is also problematic because of the changes (and dilution) that sustainable development has undergone over time. While the Brundtland definition remains the only explicit and widely accepted definition at the UN level, the concept of sustainable development has undergone significant reshaping throughout its relatively brief history. The IUCN Strategy of 1980 set natural resource conservation as the core objective of sustainable development, while the Rio Declaration of 1992 states that “human beings are at the center of concerns for sustainable development,” United Nations Conference on Environment and Development, Rio Declaration on Environment and Development, June 13, 1992, 31 I.L.M. 874, principle 1, reducing

¹⁵ Treaty on European Union pmbl., art. 3(3), Dec. 13, 2007, 2007 O.J. (C 306) 1; Treaty on the Functioning of the European Union art. 11, Dec. 13, 2007, 2008 O.J. (C 115) 47.

environmental protection to an “integral part of the development process” (principle 3). This departure from the original environmental focus has been further emphasized by the progressive fragmentation taking place, first, with the establishment of the three-pillars conceptualization of sustainable development arising from the Johannesburg Declaration of 2002,¹⁶ and then with the launch of the seventeen Sustainable Development Goals (SDGs) in the 2030 Agenda.¹⁷ These documents have turned the once-comprehensive concept of sustainable development into a number of pillars and goals, purported to be mutually reinforcing, dealing with economic, social, and (lastly) environmental issues.

Fifth, the concept of sustainable development is distinctly anthropocentric. The 1980 IUCN Strategy already placed natural resources, rather than nature itself, at the core of its objectives. This anthropocentric stance, reaffirmed in documents from the Brundtland Report to the Rio Declaration, has significant implications. First, it generates a form of hermeneutical injustice.¹⁸ By overlooking the intrinsic value of nature, anthropocentrism inherently and violently rejects other worldviews (such as animism, pantheism, and totemism), as well as the communities adhering to them, that perceive nature as endowed with intrinsic spiritual value.¹⁹ Second, this approach presents an onto-epistemological problem.²⁰ Anthropocentrism tends to prioritize the protection of environmental elements only when their degradation has a scientifically recognized negative impact on humans. However, if certain environmental harms remain undetectable by current scientific knowledge and technology, some elements crucial to human well-being may remain unprotected, ultimately undermining the very human interests that anthropocentrism seeks to safeguard. An anthropocentric approach of this kind is therefore inherently risky and may give rise to tensions with a core, though perhaps still underemphasized, principle of environmental law: the precautionary principle (Talenti 2025).

Sixth, a conceptualization of sustainable development emerging from soft law documents adheres to (and reinforces) an ontology that optimistically frames the relationship between economic activity, social development, and environmental protection. The IUCN Strategy of 1980 emphasizes that “much habitat destruction and overexploitation of living resources by individuals, communities and nations in the developing world is a response to relative poverty,” so that “it is as necessary for conservation as it is for development that . . . trade be liberalized” and that “economic and social growth be accelerated” (1980, 62). Thus the Strategy not only overlooks the fact that much habitat destruction, particularly in 1980, was driven by the so-called “developed” states; it also promotes a liberal, growth-oriented economic model as the solution to environmental issues. The depiction of economic growth as functional, or even necessary, to environmental protection is also the leitmotif of documents such as the Brundtland Report.

¹⁶ United Nations, Report of the World Summit on Sustainable Development, Johannesburg Declaration on Sustainable Development, Sept. 4, 2002, U.N. Doc. A/CONF.199/20.

¹⁷ 2030 Agenda, A/RES/70/1.

¹⁸ Hermeneutical injustice is a form of epistemic injustice that arises when a marginalized person or group lacks access to, or their contributions are excluded from, the collective interpretive resources (shared concepts, frameworks, and language) necessary to make sense of their social experiences (see Fricker 2007).

¹⁹ Harvey, for example, defines animism as the view according to which “the World is full of persons, only some of whom are human” (Harvey 2017, 9).

²⁰ As Gatt clarifies, the term onto-epistemology “indexes that questions of epistemology are inextricable from ontological ones” (Gatt (023, 3).

While recognized as “perhaps the most influential” document shaping sustainable development,²¹ the Report aprioristically frames “economic growth in both industrial and developing countries” as “essential to . . . avert economic, social, and environmental catastrophes” (World Commission on Environment and Development 1987, 96). In this way, it set the path for subsequent documents such as the Johannesburg Declaration, which frames economic development, social development, and environmental protection as “mutually reinforcing,”²² and the 2030 Agenda, which frames all SDGs—from Goal 8, on economic growth, to Goal 13, focusing on climate action—as “integrated and indivisible.”²³ It follows that, although the explicit label of *green growth* would only emerge in the early twenty-first century,²⁴ the underlying assumption that economic expansion is compatible with, and at times necessary for, achieving ecological improvements is deeply embedded across multiple authoritative documents advancing the notion of sustainable development, and thereby constitutes its mainstream conceptualization.

Such an understanding of reality, however, is scientifically flawed. First, the alleged positive relationship between economic growth and social development has been questioned and refuted by numerous scholars, with some arguing that, beyond a certain point, further GDP growth is associated with declining levels of well-being (Kubiszewski et al. 2013; D’Alisa, Demaria, and Kallis 2015; Raworth 2017; Hickel 2019; Laurent 2022; Fioramonti et al. 2022).²⁵ Indeed, while widespread poverty remains a pressing global issue, disproportionately concentrated in the Global South and exacerbated by unequal exchange with the Global North (Hickel, Dorninger, Wieland, and Suwandi 2022; Hickel, Lemos, and Barbour 2025), genuinely sustainable forms of development should, while reducing ecological pressures, effectively contribute to poverty alleviation. This can be achieved, with major efforts from the Global North, by channeling economic activity toward the provision of necessary goods and services and downscaling the production of what is unnecessary and ecologically detrimental, as aligned with the principle of common but differentiated responsibilities and respective capabilities (CBDRRC). As the UN Special Rapporteur on Extreme Poverty, Olivier De Schutter, wrote in his 2024 annual thematic report titled “Eradicating Poverty Beyond Growth”:

The ideology of “growthism” should not become a distraction from the urgent need both to provide more of the goods and services that enhance well-being and to reduce the production of what is unnecessary or even toxic. As long as the economy is driven mainly by profit maximization, it will respond to the demand expressed by the richest groups of society, leading to extractive forms of production that worsen social exclusion in the name of creating more wealth, and it will fail to fulfil the rights of those in poverty. (De Schutter 2024, para. 1).

At the same time, the notion that global GHG emissions can be reduced while global GDP continues to grow (that is, *absolute decoupling*), while being the central tenet of green growth

²¹ *Obligations of States in Respect of Climate Change - Summary of the Advisory Opinion*, Advisory Opinion, 2025 I.C.J. (July 23) 3.

²² Johannesburg Declaration on Sustainable Development, Sept. 4, 2002, U.N. Doc. A/CONF.199/20, 1.

²³ 2030 Agenda, A/RES/70/1, 5.

²⁴ According to the OECD, green growth means “fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies.” See OECD (2011).

²⁵ For studies specifically highlighting that, beyond a certain point, further GDP growth is associated with declining levels of well-being, see Max-Neef (1995); Niccolucci, Pulselli, and Tiezzi (2007); Kubiszewski et al. (2013); and O’Neill et al. (2018).

advocates, has been dismissed by several scholars and public research agencies.²⁶ The European Environment Agency, for instance, has stated that, “globally, growth has not been decoupled from resource consumption and environmental pressures and is not likely to become so” (2021, 1). Similarly, the European Parliamentary Research Service (EPRS) emphasized that “absolute decoupling of global resource use and GHG emissions from economic growth has not yet occurred and seems unlikely, if not outright impossible, to achieve in the future” (2023, 6).

Apparently, while acknowledging the significance of the social and environmental dimensions, the mainstream conceptualization of sustainable development continues to rely on the old prescription of economic growth. Indeed, it upholds the neoliberal tenet of “freer market access for the products of developing countries, lower interest rates, greater technology transfer, and significantly larger capital flows” in both industrial and less industrialized states as the ultimate solution to “social and environmental catastrophes” (World Commission on Environment and Development 1987, 96). This approach, while conflicting with scientific knowledge about the relationship between economic growth, social wellbeing, and environmental protection, aligns with the interests of “capital-exporting states [which can continue] commodifying nature and subjugating indigenous communities to capitalist priorities” (Fakhri 2015, 698).

It follows that any portrayal of sustainable development as a compromise between the economic development needs of less industrialized states and the planet’s need for environmental recovery is also unfounded.²⁷ Instead, the growth-centric perspective embedded in mainstream conceptualizations of sustainable development strongly echoes traditional Western economic interests and colonialist attitudes.²⁸ Under the banner of sustainable development, most industrialized states can now claim that their extractivist, profit-driven economic practices are not only aligned with their own economic interests, but also beneficial for both nature and social development.²⁹

Seventh, while the optimistic linkage between economic development (viewed primarily as growth) and the environmental and social dimensions is echoed in the mainstream conceptualization of sustainable development, as seen in the aforementioned soft-law documents, more progressive interpretations emerging in judicial contexts still misalign with the best available scientific knowledge. Relevant case law from the ICJ reveals a conceptualization of sustainable development that does not emphasize synergies between economic growth and environmental protection.³⁰ Instead, sustainable development is used as a tool to “reconcile” or “balance” human activities

²⁶ Beyond seminal works dating back to the 1970s, such as Georgescu-Roegen (1971), Meadows et al. (1972), and *The Ecologist* (1972), a substantial body of recent research demonstrates the impossibility of maintaining a global economic system oriented toward perpetual growth while simultaneously achieving timely and sufficient reductions in ecological impact. See, for example, Ward et al. (2016); Parrique et al. (2019); Wiedmann et al. (2020); Schroder and Storm (2020); Moranta et al. (2021); Haberl et al. (2020); EEA (2021); EPRS (2023); and Cerchini, Bajrami, and Bajraktari (2025).

²⁷ Sustainable development has been described as a compromise concept in works such as Redclift (1987).

²⁸ This missionary attitude, which justifies maintaining the status quo in the name of a common and superior good, has deep historical precedents, ranging from Kipling’s reference to “the White Man’s Burden” ([1899] 1994), to President Truman’s 1949 inaugural address ([1949] 1964), and Rostow (1959).

²⁹ While this article adopts a primarily state-centric perspective, a more nuanced analysis would benefit from incorporating a transnational lens that examines the divide between dominant and marginalized groups. Indeed, while vulnerable populations are also exploited within industrialized states, elites from both industrialized and less-industrialized states perpetuate the global exploitation of both nature and humanity. For more information, see Sørensen (1991).

³⁰ *Gabčíkovo-Nagymaros Project (Hung. v. Slov.)*, Judgment, 1997 I.C.J. 7; *Pulp Mills on the River Uruguay (Arg. v. Uru.)*, Judgment, 2010 I.C.J. 14.

with environmental sustainability.³¹ This approach, grounded in the recognition of tensions between the dimensions of sustainable development, is surely welcome.

However, this change remains limited, lacking a fully scientific and systemic understanding of the relationship between environmental protection, social wellbeing, and economic activity. Ecological science demonstrates that to ensure the long-term viability of any human system, that system must function within the Earth's safe operating space by respecting established planetary boundaries (Rockström et al. 2009; Steffen et al. 2015). Accordingly, any sustainable legal architecture must be constrained by these ecological limits, which constitute an enabling condition for both social wellbeing and economic sustainability—provided that the latter is understood as distinct from economic growth. Recognizing this would require courts to incorporate the principle of ecological primacy, under which “social and economic behavior and systems are ecologically bound, respecting planetary boundaries” (Sbert 2020, 83).³²

At the international level, the ICJ's references to sustainable development in both the *Gabčíkovo-Nagymaros* and *Pulp Mills* cases, cited in the 2025 advisory opinion, implicitly excluded the concept of ecological primacy.³³ At the EU level, however, the situation warrants closer examination. In fact, while it has already been noted that the CJEU has never resolved any case by referring to the concept of sustainable development, there has been at least one instance where the “objective” of sustainable development was further elaborated upon (Verschuuren 2016; Chiti 2024).

In the 2000 *First Corporate Shipping Case*, the Advocate General provided a crucial opinion concerning the operationalization of sustainable development with reference to its application in the context of the 1992 Habitats Directive. In this case, however, the rejection of the element of ecological primacy was made explicit. As Advocate General Léger confirmed:

The concept “sustainable development” does not mean that the interests of the environment must necessarily and systematically prevail over the interests defended in the context of the other policies pursued by the Community in accordance with Article 3 of the EC Treaty. . . . On the contrary, it emphasizes the necessary balance between various interests which sometimes clash, but which must be reconciled. *First Corporate Shipping*, Case C-371/98, Opinion of Advocate General Léger, 2000 E.C.R. I-9235, para. 54.

³¹ See, respectively, *Gabčíkovo-Nagymaros Project*, 1997 I.C.J. at 78, para. 140; *Pulp Mills*, 2010 I.C.J. at 75, para. 177.

³² Alongside “ecocentrism” and “ecological justice,” Sbert (2020) identifies “ecological primacy” as one of the three core principles of ecological law. Garver (2025, 11) similarly describes ecological primacy as “ensuring that biomass and extracted materials are obtained and used in the economy according to real needs.” Far from prohibiting all economic activity with potential ecological impacts, which would in practice include nearly all economic activity, the principle of ecological primacy requires productive systems to be organized around meeting human needs within planetary boundaries. In the context of climate change law, this would not entail a blanket prohibition on GHG emissions. Rather, it would imply a prohibition, at the global level, on emissions exceeding the remaining carbon budget compatible with keeping temperatures below 2°C above pre-industrial levels. This constraint must be coupled with the requirement that such a budget be allocated to activities of high societal value, thereby precluding the continuation of an economic system that prioritizes economic growth for its own sake. At the state or regional level, this constraint would translate into non-exceedable annual carbon budgets, allocated according to factors such as population and historical responsibility for emissions, in line with the principle of common but differentiated responsibilities and respective capabilities.

³³ In the *Gabčíkovo-Nagymaros* case, the Court stated that the “need to reconcile economic development with protection of the environment is aptly expressed in the concept of sustainable development,” thereby framing the two as compatible. *Gabčíkovo-Nagymaros Project (Hung. v. Slov.)*, Judgment, 1997 I.C.J. 7, para. 140. In the *Pulp Mills on the River Uruguay (Arg. v. Uru.)*, Judgment, 2010 I.C.J. 14, para. 177.

Courts' explicit or implicit dismissal of ecological primacy when balancing the diverging sustainable development components shows the persistence of a misalignment between sustainable development, even when operationalized in legal practice, and best available scientific knowledge. This discrepancy prompted scholars such as Capra and Mattei (2015, 1) to advocate for the harmonization of legal frameworks with ecological science in the form of a new "ecology of law."

As this section has shown, sustainable development suffers from an unclear legal status, ambiguous origins, a shifting definition, reliance on an anthropocentric perspective, and a "win-win" understanding of the relationship between economic growth and environmental improvement, typical of green growth, which becomes "win-win-win" when the social dimension is added, despite a complete lack of scientific grounding. The mainstream conception of sustainable development, emerging primarily through soft-law documents, contrasts with more progressive interpretations found in court rulings. However, courts, while avoiding the automatic framing of economic growth as inherently beneficial for social and environmental goals, still fall short by not incorporating ecological primacy.

It follows that, as climate change is a "common concern of humankind" requiring action "on the basis of the best available scientific knowledge" (Paris Agreement pmbl.), linking the climate change regime to any conceptualization of sustainable development or its scientifically weak ontology would be structurally incoherent and outright hazardous. The next section examines the three climate change treaties from a post-sustainable-development perspective, assessing the extent to which the problematic mainstream conception of sustainable development has shaped the international climate regime.

III. The International Climate Change Regime and Its Reliance on the Concept of Sustainable Development

This section of the article will be devoted to the analysis of climate change treaties' texts, and it will try to understand whether, and how deeply, the concept of sustainable development is entrenched within the international climate change regime. Recognizing that the concept of sustainable development can manifest in many ways, this section focuses on climate change treaties' reliance on the most problematic conceptualization of sustainable development—the mainstream one. To do so, it will analyze them from a post-sustainable-development perspective.

A. The Post-Sustainable-Development Perspective

It is essential to delineate the contours of the post-sustainable-development perspective and to clarify how it will be operationalized. The choice to adopt a *perspective* rather than a *methodology* is deliberate. Given the wide range of materials that articulate or rely on sustainable-development ontologies (for example, treaty provisions, policy documents, case law, and scholarly analyses), this study requires an analytical lens flexible enough to engage with heterogeneous sources. A predetermined methodological template would introduce interpretive rigidities and apply only to a narrow category of documents. For this reason, the analysis proceeds from a broader, concept-driven perspective.

A post-sustainable-development perspective recognizes the limitations of the mainstream conceptualization of sustainable development, particularly its a priori assumption that economic growth is essential to, or at least compatible with, reducing environmental pressures and improving

social wellbeing. By contrast, it acknowledges the existence of an irreconcilable trilemma between ecological protection, social protection, and economic growth, and recognizes that, insofar as the growth imperative continues to underpin the current productive structure, an artificial tension will inevitably arise between the ecological and social dimensions. This tension stems from capital's need to expand through either ecological or social extraction.

Accordingly, such a perspective seeks to identify, highlight, and critically examine those elements in legal, policy, or scholarly documents that reinforce this growth-oriented narrative despite lacking grounding in the best available scientific knowledge, necessitating critical scrutiny.

Clearly, such a perspective comes with its own ontological lenses, which significantly differ from those of mainstream sustainable development. While sharing sustainable development's focus on the interplay among economic, social, and environmental dimensions, the post-sustainable-development perspective emphasizes the tradeoffs that often define these relationships, thereby challenging mainstream ontological assumptions. Furthermore, it foregrounds the concept of ecological primacy (an element largely overlooked in both mainstream and progressive interpretations of sustainable development), asserting the centrality of the ecological dimension.

This perspective critically acknowledges the weak correlation between global economic growth and social development, as well as the significant challenge of decoupling global GDP growth from increasing GHG emissions rapidly enough to fulfil the commitments established under the Paris Agreement, as discussed in the previous section. Consequently, it is openly critical of any framework that treats economic growth, whether at the global level or within developed countries, as either a means to achieve climate change mitigation or as an end in itself.

Adherence to the post-sustainable-development ontology, while aiming to eliminate any ideological depiction of the relationship between economic development, social well-being, and environmental protection, also depends on a set of preconstructed beliefs. Specifically, the post-sustainable-development ontology is grounded in a belief in the reliability of ecological sciences, and in the consequent necessity to establish the climate change regime (like any other environmental regime) on a scientifically grounded understanding of the relationship between its environmental, social, and economic dimensions.³⁴

It might be objected that ecological sciences have been shaped, at least in part, by Western scientific traditions which themselves emerged from an anthropocentric culture of human dominance over nature, a culture historically intertwined with both imperialism and capitalism.³⁵ Nevertheless, the requirement that the climate change regime rely on scientific knowledge is expressly embedded in the climate change treaties, requiring responses "to the urgent threat of climate change on the basis of the best available scientific knowledge," (Paris Agreement pmb.), and both the understanding and the production of such knowledge have changed over time. Today, scientific knowledge is no longer confined to Western-centric perspectives. Rather, today's best available scientific knowledge has shifted from a mechanistic paradigm (knowledge as an

³⁴ Comprehensive scientific evidence attesting to the primacy of the environmental dimension can be found in Crutzen and Stoermer (2000), Rockström et al. (2009), and Steffen et al. (2015).

³⁵ Traces of this anthropocentric culture of domination can be found in Francis Bacon's ([1620] 2000) *Novum Organum*, which notably depicted nature as a "beast to be dominated," and René Descartes's ([1644] 1983) *Principia Philosophiae*, which reduced nature to "inert matter."

instrument “to dominate and control nature”) to a systemic, ecological paradigm (scientific knowledge as a way “to learn from and cooperate with nature” (Capra and Mattei 2015, 13)).

Against this background, this section operationalizes the post-sustainable-development perspective through the adoption of a double-layered analysis. First, the discussion will take note of the explicit references climate change treaties make to sustainable development, while also detecting references to similar concepts such as “sustainable social and economic development” and “sustainable economic growth and development.”³⁶

Second, the discussion conducts a contextual analysis, examining treaties’ adherence to the mainstream sustainable development ontology. This adherence is manifested by indicators such as whether climate change treaties explicitly identify sustainable development or economic growth as primary objectives; how they characterize the relationship between economic growth and environmental protection as inherently synergistic; and whether they prioritize market-based instruments for achieving climate change mitigation goals.³⁷ Although it may be difficult to directly attribute these elements to the treaties’ adherence to the concept of sustainable development, their presence will nevertheless reveal a clear alignment with the growth-dependent ontology that the mainstream conceptualization of sustainable development helps crystallize.

For reasons of space, a third, meta-level of analysis focusing on the normalization of vocabulary across climate change treaties will not be included. Nonetheless, this article acknowledges that legal vocabulary plays a role in shaping imaginaries and worldviews (Kennedy and Koskenniemi 2023). Specifically, climate change treaties conceptualize the global arena as split between *developed* and *developing* countries. This distinction, which highlights the economic dimension of climate change treaties instead of explicitly classifying countries, for instance, as *more* and *less responsible* for climate change (the environmental dimension), is purely political,³⁸ indicating a strong tie between the climate change regime and mainstream sustainable development discourse.

B. The United Nations Framework Convention on Climate Change

Signed in Rio in 1992 during the Earth Summit (which gave birth, among other things, to the Rio Declaration, one of the UN documents contributing to the spread and transformation of the concept of sustainable development), and entered into force in 1994, the United Nations

³⁶ A large number of references to sustainable development and related concepts in legal texts can be seen as a reflection of climate change treaties’ (and country Parties’) legitimation and reliance on such concepts. This analysis should be qualified in two ways. First, as noted in Section I, sustainable development admits of multiple interpretations. Under the Vienna Convention on the Law of Treaties, art. 31, May 23, 1969, 1155 U.N.T.S. 331 (VCLT), treaty terms must be interpreted in light of their context, which for climate change treaties includes principles such as CBDRRC and the precautionary principle. Consequently, some references to sustainable development may need to be read in the light of these contextual elements, yielding interpretations that diverge from its mainstream formulation. References in treaty texts therefore do not necessarily signal reliance on its mainstream conceptualization. Second, as highlighted in Part II, sustainable development can appear in various forms: not only as an explicit principle, objective, or goal, but also as a narrative that embeds anthropocentric views and imports green-growth assumptions. Thus, even where treaties omit explicit references to sustainable development, they may nonetheless implicitly draw on the ontology associated with its mainstream conception. The underlying sustainable-development ontology may therefore shape climate treaties irrespective of whether the term itself is invoked.

³⁷ The emphasis on market mechanisms in mitigation, adaptation, and loss and damage reflects a clear faith in positive synergies between economic and environmental dimensions. However, these instruments often reinforce the status quo by monetizing nature’s value, thereby legitimizing practices like GHG emissions in exchange for monetary compensation.

³⁸ This distinction may be the result of a political decision to avoid directly blaming “developed” (that is, most responsible) countries for the GHGs they have emitted.

Framework Convention on Climate Change (UNFCCC) is the oldest and still effective international climate change treaty. Being a framework convention, its main aim was not the identification of any rigid climate change mitigation or adaptation target, but rather the acknowledgment of the common concern for humankind represented by climate change, and the establishment of an institutional platform to be used as a basis for subsequent climate change negotiations (Freestone 2016).

The UNFCCC treaty text makes just one explicit reference to “sustainable development” (art. 3), while it also refers to “sustainable economic growth and development” (art. 3), “sustainable social and economic development” (pmb.), and “sustainable economic growth” (art. 4). Both references to “sustainable development” and “sustainable economic growth and development” are made in article 3, the article devoted to the identification of the principles guiding Parties’ “actions to achieve the objective of the Convention.” More specifically, article 3(4) recognizes a “right to sustainable development,” and it encourages Parties not simply to achieve but to *promote* sustainable development. The reference to the “promotion” of sustainable development is notable, as it justifies and normalizes a greater engagement of Parties in the spread of sustainable development narratives even beyond their borders.

Moreover, economic development is not simply framed as beneficial for the environment. Rather, the treaty provision depicts “economic development” as “*essential* for adopting measures to address climate change.” The existence of such a strong statement in the “Principles” section of the framework convention on climate change serves as clear evidence of the climate change regime’s foundational reliance on the mainstream sustainable development ontology, aprioristically framing economic development as a *sine qua non* for effective climate action.

Subsequently, article 3(5) asks Parties to cooperate for the achievement of “sustainable economic growth and development,” therefore framing economic growth as one of the aims of climate change cooperation. Most importantly, the article states that “measures taken to combat climate change. . . should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.” This sentence is extremely relevant. While the Convention does not provide explicit definitions of “arbitrary or unjustifiable discrimination” or “disguised restriction” of trade, its language closely mirrors the chapeau of Article XX of the 1947 General Agreement on Tariffs and Trade (GATT), identifying the general exceptions to the Agreement’s provisions.³⁹ The strong alignment between the climate convention and the US-championed trade agreement provides further insight into the political culture underpinning the UNFCCC. Moreover, it must be noted that WTO Appellate Body interpretations of these provisions have been particularly broad, effectively restricting the range of climate measures that states can implement and, in some cases, leading to the annulment of environmental protection policies.⁴⁰

Evidently, the same international treaty which frames climate change as a common “concern of humankind” simultaneously imposes procedural and substantive trade law requirements that might complicate the implementation of climate change mitigation measures. Hence, it appears that the UNFCCC places concerns for international trade integrity above concerns for climate

³⁹ General Agreement on Tariffs and Trade, art. XX, Oct. 30, 1947, 61 Stat. A-3, 55 U.N.T.S. 194 (GATT).

⁴⁰ See, among other documents, Appellate Body Report, *United States—Import Prohibition of Certain Shrimp and Shrimp Products*, WTO Doc. WT/DS58/AB/R (adopted Nov. 6, 1998); Appellate Body Report, *Brazil—Measures Affecting Imports of Retreaded Tyres*, WTO Doc. WT/DS332/AB/R (adopted Dec. 17, 2007); see generally Matsushita et al. (2015).

consequences, in line with the anthropocentric and optimistic conceptualization of the nature-human relationship underpinning the mainstream concept of sustainable development.

References to “sustainable social and economic development” and “sustainable economic growth” are made, respectively, in the Preamble and in article 4(2)(a) of the UNFCCC. The Preamble openly frames “sustainable social and economic development” as a goal and recognizes that “all countries . . . need access to resources” in order to achieve it. Moreover, the same section of the Preamble states that, in order to achieve this goal, states’ “energy consumption will need to grow.” Thus, the Preamble of the first climate change treaty actually legitimizes an increase in energy consumption, in hopes that “the application of new technologies” will be sufficient for “achieving greater energy efficiency and for controlling greenhouse gas emissions in general.” This perspective disregards the rebound effects described in Jevons’ Paradox.⁴¹ Moreover, it risks creating moral hazards, and it systematically evades critical engagement with the fundamental economic paradigm fueling climate change.⁴²

Article 4(2) of the UNFCCC is devoted to the identification of Annex I Parties’ commitments.⁴³ Article 4(2)(a) obliges each “developed” country party to “adopt national policies and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases.” However, the article continues, when implementing these policies, it will be necessary to consider developed Parties’ “need to maintain strong and sustainable economic growth.” This treaty provision does not only dogmatically frame strong and sustainable economic growth for developed countries as a “need,” by linking this need to the commitments of Annex I Parties, it also creates an opportunity to use the pursuit of economic growth as a justification for derogating from, or adopting less stringent, climate change mitigation measures. The peculiar wording of the treaty provision invites two potentially compatible interpretations. First, it may indicate that the Parties to the UNFCCC considered maintaining high levels of economic growth as a priority over addressing climate change. Second, it might reflect a belief among the Parties that pursuing economic growth is either necessary for, or at least compatible with, climate change mitigation efforts.

Finally, the UNFCCC contains a relatively small number of references to sustainable development and related concepts. However, these references profoundly affect the architecture of the first climate change treaty and, thus, of the entire international climate change regime. Indeed, the emphasis placed by the UNFCCC on the concept of sustainable development and its growth-oriented ontology provides significant insights into the political culture that shaped the negotiation of the convention. As Castro (2003, 197) observes, the 1992 Earth Summit “counted on the participation of most of the nation-states on earth, the majority of which were governed by elites committed to the neoliberal agenda.” Such reliance on the neoliberal agenda was evidently mirrored in the text of the UNFCCC. Despite establishing an international climate change negotiation framework, the 1992 Convention arguably legitimizes and reinforces the maintenance of a global economic system centered on the pursuit of perpetual economic growth, which is portrayed as essential for developed nations and as a key objective of international climate

⁴¹ Jevons’ Paradox states that efficiency gains do not necessarily reduce ecological pressures; in fact, due to reduced costs of production, efficiency gains may increase production, consumption, and, ultimately, resource extraction (Jevons 1865).

⁴² According to Fraser (2019, 96), capitalism represents “the socio-historical driver of climate change, and the core institutionalized dynamic that must be dismantled in order to stop it.”

⁴³ The UNFCCC distinguishes among Annex I, Annex II, and non-Annex Parties to the Convention. The list of Annex I Parties includes both so-called “developed countries” and “economies in transition” (Freestone 2016).

cooperation. The UNFCCC appears to prioritize economic interests over environmental concerns, not only legitimizing increases in global energy consumption but also stipulating that climate change mitigation policies must be implemented in a manner that does not adversely affect international trade.

C. The Kyoto Protocol

Launched at COP 3 in 1997,⁴⁴ the Kyoto Protocol is the first protocol to the UNFCCC. The aim of the Protocol was to go beyond the general framework established under the UNFCCC, and to begin identifying precise climate change mitigation commitments for Annex I Parties (Freestone 2016). The approach adopted by the Kyoto Protocol is typically top-down (Leal-Arcas 2012), as it identifies Annex I Parties' emission limitation or reduction commitments.⁴⁵ Given that these emission commitments had to be achieved by 2012, and given that amendments to the Protocol for the establishment of further commitment periods did not timely enter into force,⁴⁶ the Kyoto Protocol no longer has any legal effect. Nonetheless, this subsection analyzes the protocol in order to follow the changing role that the concept of sustainable development has played in the transformation of the international climate change regime.

It must be acknowledged that the Kyoto Protocol never refers to economic growth, nor to further concepts which might be seen as adjacent to sustainable development. Nevertheless, this absence is compensated for with a higher number of explicit references to "sustainable development" (arts. 2, 10, 12). The Protocol refers three times to sustainable development, tripling the number of references present in the UNFCCC five years prior. The substitution of less consolidated expressions in the earlier document (such as "sustainable social and economic development") for plain references to sustainable development may reflect the stronger and broader international acceptance of the concept of sustainable development.

Article 2 identifies procedural obligations for Annex I Parties, with article 2(1) stating that "each Party included in Annex I, in achieving its quantified emission limitation and reduction commitments under Article 3, in order to promote sustainable development, shall" implement measures set forth in article 2(1)(a) and 2(1)(b). Three general points should be highlighted regarding this provision. First, as was the case for article 3(4) of the UNFCCC, it is not the "pursuit" but rather the "promotion" of sustainable development that lies at the heart of article 2(1). Moreover, the reference to the promotion of sustainable development in the Kyoto Protocol holds greater significance than in the UNFCCC. In the Protocol, the task of promoting sustainable development is only assigned to "developed" country Parties (Annex I Parties). This requires them to intervene only in the domestic policy of "developing" states (non-Annex I Parties), thus legitimizing the export of the industrialized states' model of sustainable development.

Second, article 2 is designed in such a way as to not simply exhort, but actually oblige Annex I Parties to promote sustainable development. Indeed, unlike the UNFCCC (Parties "should promote sustainable development"), the Protocol frames the promotion of sustainable

⁴⁴ COP 3 was the third Conference of the Parties to the UNFCCC. Kyoto Protocol, Dec. 11, 1997, 2303 U.N.T.S. 162.

⁴⁵ Annex I Parties emission limitation or reduction commitments are listed in the Kyoto Protocol Annex B.

⁴⁶ The Doha Amendment to the Kyoto Protocol, establishing new emission targets to be achieved by 2020, only entered into force on December 31, 2020. See UN Framework Convention on Climate Change, *Doha Amendment—Background*, <https://unfccc.int/process/the-kyoto-protocol/the-doha-amendment>.

development as an obligation: “Each Party included in Annex I, . . . *shall*” (art. 2(1)). This shows the growing prominence assumed by the sustainable development concept.

Third, it is important to observe that the specific framing of Article 2 does not depict the promotion of sustainable development as instrumental for fighting climate change. Rather, it frames the promotion of sustainable development as an autonomous objective that underpins the legal obligations specified in articles 2(1) and 2(2) (“Parties included in Annex I, . . . *in order to* promote sustainable development, shall implement and/or further elaborate policies and measures”). In this formulation, sustainable development is not simply a guideline for Annex I Parties to consider when fulfilling their limitation commitments. Rather, it suggests that the negotiators of the Protocol deliberately positioned the promotion of sustainable development, together with emission limitation commitments, as the explicit and foundational justification for Annex I Parties’ climate obligations. This not only underscores the heightened legal significance of sustainable development in international climate policy, now positioned as a central and co-equal objective of developed countries’ climate strategies; it also highlights the distinctly anthropocentric perspective, characteristic of the sustainable development concept, embedded within the Kyoto Protocol’s design for climate action.

Article 10 of the Kyoto Protocol identifies obligations for all Parties to the Convention and, in a fashion that recalls article 2(1), it states that “all Parties” shall respect the procedural obligations laid out in Article 10 “continuing to advance the implementation of commitments [listed at Article 4(1)] in order to achieve sustainable development.” Even in this case, rather than requiring compliance with climate change treaty obligations for the sake of protecting the Earth’s atmosphere, the article’s approach remains anthropocentric, justifying such obligations in the name of sustainable development. In addition, unlike Article 2, which frames sustainable development as an objective for Annex I Parties to promote, Article 10 explicitly refers to “achieving” sustainable development. This distinction arises because Article 10 applies to both Annex I and non-Annex I Parties. Hence, while Article 2 gives Annex I Parties the duty to promote sustainable development outside of their borders, Article 10 reminds all Parties to the Protocol that their climate change efforts will be rewarded by the promise of achieving sustainable development. Evidently, sustainable development remains the pot of gold at the end of the rainbow of climate action. This allows developed countries to continue advancing their economic and political agendas through the narrative of sustainable development, while less industrialized states hope to capitalize on this narrative to secure economic advantages (Redgwell 2016).

The final reference to sustainable development occurs in the context of article 12, which outlines the purpose and operation of the Clean Development Mechanism (CDM). As one of the market-based instruments established under the Kyoto Protocol, alongside the Joint Implementation mechanism and emissions trading (arts. 6, 7), the CDM is fundamentally premised on the neoliberal economic assumption that the pursuit of self-interest, whether by states or private actors, coupled with the establishment of ad hoc markets (such as for carbon credits) adhering to liberal market principles, can effectively drive significant environmental improvements. The very nature of the CDM is closely aligned with the win-win conceptualization of the relationship between economic and environmental dimensions advocated by the mainstream sustainable development narrative.⁴⁷

⁴⁷ This article will not address the effectiveness of the CDM or market mechanisms in general. However, it is worth noting that scholars have raised significant concerns about these mechanisms, highlighting issues such as difficulties in establishing baselines for monitoring their impacts, challenges related to additionality, and potential human rights

The second paragraph of article 12(2) refers to sustainable development, stating that “the purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention.” As was the case with Articles 2 and 10, Article 12 frames the achievement of sustainable development as connected with the “stabilization of greenhouse gas concentrations in the atmosphere.”⁴⁸ Crucially, however, in the context of the CDM, sustainable development is not merely a vocational objective for country Parties to consider. Instead, promoting its achievement is presented as a tangible prerequisite that Annex I Parties willing to utilize the CDM “shall” meet, thus representing the first instance in a climate change treaty where sustainable development is fully operationalized. Article 12, therefore, makes the pursuit of sustainable development a mandatory condition for the activation of a market mechanism, even though, as Holm Olsen, Arens, and Mersmann (2018, 384) stress, “there has never been a strong political mandate or common methods of sustainable development assessment of climate actions internationally.”

Evidently, the concept of sustainable development holds a significant place within the framework of the Kyoto Protocol. While references to sustainable development are relatively few (though more frequent than in the UNFCCC), it occupies a crucial role in key sections of the Protocol. The Kyoto Protocol generally portrays the achievement of sustainable development as one of the core rationales for climate action, turning its promotion into a legally binding obligation, but for most industrialized states only. While this conceptualization serves an evocative role in Articles 2 and 10, it assumes an operational role in Article 12, where assisting less industrialized states in achieving sustainable development is established as a prerequisite for activating a market mechanism. Clearly, the Kyoto Protocol not only contributes to normalizing the mainstream sustainable development ontology, but also pushes the regime toward centralizing and operationalizing the concept.

D. The Paris Agreement

Signed in December 2015, and entered into force only one year later, the Paris Agreement is the last international climate change treaty contributing to the formation of the international climate change regime. The Paris Agreement is a legally binding international treaty which aims at “enhancing the implementation of the Convention” (art. 2(1)). Unlike the Kyoto Protocol, the Paris Agreement relies on a bottom-up architecture (Doelle 2016). While it fixes legally binding global outcomes (art. 2(1)(a), 4(a)), it only identifies procedural obligations for country Parties (arts. 3, 4(2)), leaving each state with the responsibility of establishing individual climate change mitigation and adaptation commitments (arts. 3, 7(9)). Furthermore, the Agreement is the first climate change treaty to move away from a rigid distinction between Annex I and non-Annex Parties’ commitments to the Convention. In fact, despite underscoring the role of the CDRRC Principle (art. 2(2)), the Paris Agreement requires “all Parties” to commit in order “to achiev[e] the purpose of this Agreement as set out in Article 2” (art. 3).

The Paris Agreement is by far the climate change treaty with the highest number of references to sustainable development, including in its Preamble. Sustainable development is mentioned twelve times by the treaty (four times more than in the Kyoto Protocol), and the Agreement’s coherence with the outline sketched by the 2030 Agenda has been underscored by scholars such as Dzebo et

violations associated with their implementation (de Coninck and van der Linden 2003; Anagnostopoulos, Flamos and Psarras 2004; Schade and Obergassel 2014; Dehm 2016).

⁴⁸ The “ultimate objective of the Convention” is identified at the UNFCCC art. 2.

al. (2019). The Paris Agreement is also the first climate change treaty to plainly refer to the promotion of economic growth. While the UNFCCC referred to both “sustainable economic growth and development” (art. 3(5)) and to “strong and sustainable economic growth” (art. 4(2)(a)), the Paris Agreement makes an explicit reference to economic growth without even qualifying that growth as, somehow, sustainable. Given the large number of references to sustainable development made in the Agreement, their analysis will not be as granular as in the case of the two previously examined climate change treaties.

Notably, the Paris Agreement is the first climate treaty to refer to sustainable development as a *context* (arts. 2(1), 4(1), 6(8)). None of the major international instruments that helped shape the concept had previously characterized it in this way. References to the “context of sustainable development” appear in articles 2, 4, and 6, which respectively address the Agreement’s overarching objective, the Parties’ Nationally Determined Contributions, and the mechanisms designed to enhance Parties’ capacities to achieve their commitments.

Article 2(1), setting out the Agreement’s global objective, states that it “aims to strengthen the global response to the threat of climate change, in the context of sustainable development.” Characterizing sustainable development as a context fundamentally reframes the nature of the concept. Through this provision, the Paris Agreement identifies sustainable development and the ontology it presupposes as the overarching frame within which climate responses must be conceived and bounded. In doing so, the Agreement consolidates reliance on the sustainable-development ontology, and positions it as the primary framework through which legitimate climate action is designed and implemented.

The provision of the Paris Agreement containing the highest number of references to sustainable development is article 6. Indeed, with six explicit mentions, article 6 accounts for half of the Agreement’s total references to the concept. As article 6 sets out the market and non-market mechanisms through which Parties may cooperate to achieve the Agreement’s objectives, it has a distinctly operational character. As with the Kyoto Protocol’s provisions on the CDM, article 6 frames sustainable development as a key parameter guiding the use of these instruments. Moreover, in a manner that clearly echoes Article 12 of the Kyoto Protocol, article 6 imposes obligations on Parties to *promote* sustainable development when engaging with these mechanisms. Unlike the Kyoto Protocol, however, this obligation extends to all Parties. Specifically, article 6(2) states that “Parties shall, where engaging on a voluntary basis in cooperative approaches that involve the use of internationally transferred mitigation outcomes towards nationally determined contributions, promote sustainable development.”

The promotion of sustainable development is framed as a *sine qua non* for the activation of mechanisms identified under article 6, suggesting three main points. First, like other references to sustainable development in climate change treaties, article 6 takes for granted the possibility of virtuous synergies between climate action and the pursuit of sustainable development. Second, although article 6 establishes the promotion of sustainable development as a parameter governing the use of cooperative mechanisms, as was the case in article 12 of the Kyoto Protocol, it does not specify what such promotion entails. Even after the eventual adoption of the “Article 6.4 Sustainable Development Tool” in 2024, within the Paris Agreement Rulebook, sustainable development remains underdefined (UNFCCC 2024). The Tool largely relies on self-reported monitoring, reporting, and verification by project proponents, offers no definition of sustainable development, and grounds its interpretation primarily in the SDG framework, thereby remaining

rooted in a growth orientation (UNFCCC 2024). Third, as a consequence, this uncertainty grants Parties considerable discretion to adopt definitions of sustainable development that align with their own interests, thereby creating space for neocolonial, green-extractivist initiatives to be advanced under the broad and malleable banner of promoting sustainable development.

From a post-sustainable development perspective, it is also relevant to consider the Paris Agreement's explicit reference to economic growth. Article 10, which addresses technology development and transfer, states in paragraph 5 that "accelerating, encouraging and enabling innovation is critical for an effective, long-term global response to climate change and promoting economic growth and sustainable development." By linking the promotion of economic growth to a justification for accelerating innovation, the Agreement presents economic growth as intrinsically desirable. This explicit endorsement may be seen as evidence of the normalization of green-growth assumptions within climate treaties, suggesting that the once-contested paradigm of perpetual economic expansion has become so deeply embedded that it no longer requires the discursive shelter of sustainable development to appear in a climate change treaty.

Finally, the Paris Agreement stands out as the climate change treaty with the most references to sustainable development. The references in Articles 2, 4, and 6 play a particularly significant role in redefining the concept. By framing sustainable development, for the first time, as a *context*, the Agreement elevates its underlying ontology to the status of the overarching frame within which legitimate climate action must be designed. Moreover, through Article 6, the Agreement, continuing a trend initiated by the Kyoto Protocol, identifies the promotion of sustainable development as a precondition for activating both market and non-market mechanisms. This implies that sustainable development is an objective parameter, despite the fact that neither the Agreement nor its rulebook provides any robust definition for its implementation. Finally, the Agreement's explicit treatment of economic growth as one of the goals of technology development and transfer—eschewing the need to frame it under the guise of sustainable growth or sustainable development—warrants particular attention, as it unequivocally highlights the Agreement's underlying faith in the desirability of economic growth.

IV. Overcoming Sustainable Development: Towards a Coherent Climate Change Regime

Recent data from the Mauna Loa Observatory show that humanity is still far from achieving the objective set forth in Article 2 of the UNFCCC: the stabilization of GHG concentrations in the atmosphere (Scripps Institute of Oceanography 2023). This situation highlights the limits of the over 30-year-old international climate change regime, and it should bring scholars and researchers to apply critical lenses when searching for the reasons behind its ineffectiveness. There seems to be an elephant in the room of climate change treaties: their reliance on the concept of sustainable development, and on the maintenance of the growth-oriented productive system it justifies. While mainstream interpretations of sustainable development should be distinguished from more progressive ones, both types of conceptualizations lack grounding in best available scientific knowledge concerning the relationship between economic systems and ecosystems.

No extant interpretation of sustainable development explicitly acknowledges the principle of ecological primacy. Moreover, in its mainstream conceptualization, sustainable development rigidly portrays the relationship between development (understood as economic growth) and environmental and social dimensions as inherently synergistic. As this article has shown, while

scholarly evidence indicates that the relationship between economic growth and social well-being is not linear and may even become negative beyond a certain point, no proof has been offered that global economic growth is necessary to protect the natural environment. Instead, extensive research demonstrates that the pursuit of perpetual growth is fundamentally incompatible with both environmental protection and the timely mitigation of climate change.

While this article does not aim to demonstrate that the international climate change regime's attachment to sustainable development is the main cause of the regime's incapacity to reach its core objectives, it has observed that climate change treaties have been increasingly underpinned by the mainstream sustainable development ontology. One result of this dependence is the legitimization of scientifically flawed ontological lenses when it comes to the design and implementation of climate change policies and measures. Not even the 2025 ICJ Advisory Opinion has been capable of providing a substantive, ecologically oriented definition, instead deferring to existing growth-centric interpretations. It follows that the climate change regime's reliance on the mainstream conceptualization of sustainable development has been an obstacle since its establishment in 1992. The centrality of a concept which promotes optimistic yet empirically unsubstantiated green growth views is at odds with the climate change regime's recognized need to be based on best available scientific knowledge.

To enhance the internal coherence and, possibly, the effectiveness of the climate change regime, it appears necessary to detach it from the scientifically questionable mainstream sustainable development ontology. Moreover, more progressive interpretations of sustainable development, such as those identified by courts, require enhancement by acknowledging ecological primacy. This may entail either a deep, scientifically grounded reconceptualization of sustainable development, or a complete replacement of the concept with ecologically centered alternatives.

Scholars in economics and political theory have gained valuable insights from the fields of ecology and earth sciences. This cross-disciplinary exchange has yielded novel disciplines,⁴⁹ conceptual frameworks,⁵⁰ and corresponding theories.⁵¹ Legal scholarship has likewise been influenced by these developments, giving rise to transformative approaches such as wild law, ecological law, and Earth system law.⁵² Despite their differences, these approaches converge on a central claim: the prevailing model of perpetual economic growth is ontologically detached from, and therefore incompatible with, ecological realities. Collectively, these strands of critical legal scholarship have helped to develop concepts such as the "sustainability principle" (Bosselmann 2008), "ecological sustainability" (Ross 2009), and "sustainability of ecosystems" (Chiti 2022).

These new legal concepts align with the best available scientific knowledge, recognizing that a global economic system focused on perpetual expansion is neither compatible with planetary boundaries nor necessary for enhancing human wellbeing. They recognize the inherent tension between economic growth and environmental protection, thereby aligning with a post-sustainable-development ontology. Crucially, they are built on the understanding that protecting the natural environment is a prerequisite, not only for safeguarding economic and social interests, but for

⁴⁹ These disciplines include ecological economics (Costanza 1989) and political ecology (Clark 2012).

⁵⁰ Such frameworks include wellbeing economics, sufficiency economics, doughnut economics, social metabolism, eco-socialism, and ecological democracy (Martinez-Alier et al. 2010; Raworth 2017; Eckersley 2020; Fioramonti et al. 2022).

⁵¹ Such theories include post-growth theories (Dorninger et al. 2021) and the theory of ecologically unequal exchange (Fioramonti 2024).

⁵² See, for example, Burdon (2010); Garver (2013); Petersmann et al. (2022); du Toit and Kotzé (2022).

sustaining all forms of life. As such, they offer promising tools for balancing competing interests while placing ecological primacy at the center of legal decision-making.

It will not be easy to modify the international climate change regime in a timely manner so as to free it from the sustainable development yoke. While extensive efforts will be required to embed these new concepts within economic structures, political narratives, and legal systems, one point already deserves emphasis: as Law and Political Economy scholarship underscores, it would be naïve to treat the shortcomings of existing legal frameworks, including ostensibly ecological ones, as mere technical oversights (Britton-Purdy et al. 2020). Indeed, while this article has deliberately refrained from opening the Pandora's box of explaining the persistence and incorporation of the growth-oriented mainstream formulation of sustainable development into the climate change regime, previous research has traced these dynamics to the interests of the most powerful states shaping international law (M'Gonigle and Takeda 2013), thereby normalizing and legitimizing the global capitalist system as the only possible system of production (Pistor 2025).

To the extent that global politics remains driven by the logic of inter-state competition, and subsumed within the imperatives of capital accumulation and expansion, these states, acting as paradigmatic “capitalist enterprises” (Pérez-Valenzuela 2025), will seek to secure and expand their power through, among other things, the justification and legitimation of continuous economic growth. The result is an international legal order that legitimates the maintenance of an economic system oriented toward perpetual growth, continual capital accumulation, and profit maximization, often at the expense of ecological integrity and distributive justice, and to the benefit of a wealthy and powerful minority.

Overcoming this problematic understanding of sustainable development and establishing a climate change regime that acknowledges the undesirability (indeed impossibility) of perpetual economic expansion may require confronting two structural features that profoundly characterize contemporary global institutional and economic configurations. First, an effective climate change regime would entail a restructuring of the state-centered global political system, recognizing a greater role for participatory, communitarian, and democratically governed non-state actors (Talenti 2023). Second, it would require, in the words of Hauge and Hickel (2025, 15), a willingness to “question the status quo of the capitalist economic system.”

Law and governance scholars therefore have a crucial role to play. First, interdisciplinary engagement with ecological research must be deepened and normalized. This includes translating emerging sustainability concepts into legal terms, integrating them into regulatory frameworks, examining their interaction with existing norms, and critically assessing the consequences they may introduce. Second, while utilizing a post-sustainable development perspective can help demystify the mainstream, growth-centric ontology, it must also actively open space for pluralistic, decolonial conceptualizations of development. These alternatives should be grounded in distributive justice and in the satisfaction of fundamental needs within ecological boundaries, rather than in aggregate GDP expansion. In this way, they orient toward the aim of remaining within planetary boundaries while leaving no one behind (Taratori and Comim 2025).

Third, new critical legal approaches are needed to directly problematize green-growth assumptions, ensuring that a priori assumptions about the possibility of decoupling economic growth from ecological pressures are no longer normalized or crystallized in legal orders. These approaches should draw on existing legal principles, assess regulatory frameworks against the best available

scientific knowledge on ecosystem functioning, and expose the contradictions between ambitious environmental goals and growth-oriented measures. Finally, sustained engagement with political economy is essential, as the formation of any new climate regime will depend not only on demonstrable effectiveness but also on confronting the interests embedded in current economic, political, and legal structures, which often crystallize the interests of a minority at the expense of the broader majority. Without directly challenging entrenched power configurations, and the interests they protect, no genuinely effective climate regime can emerge.

Overcoming the mainstream conceptualization of sustainable development is indispensable. Doing so will enable policymakers, courts, scholars, environmental activists, and the climate regime itself to move beyond a scientifically flawed, ontologically biased, and ultimately unsustainable representation of the relationship among environment, society, and economy, one that the dominant framing of sustainable development continues to normalize, justify, and crystallize.

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