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ARTICLE

Beyond Crisis and Ambition: Operative Closure as a Critical Lens for Observing International Environmental Law and the South China Sea

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Abstract

Current scholarship often views international environmental law (IEL) through a crisis or ambition lens. The "crisis lens" apologizes for the limitations of doctrinal methods in resolving disputes. The "ambition lens" seeks to align IEL with a planetary perspective but is criticized for utopianism. We offer a social-systems-theoretical alternative. IEL's ability to learn and adapt to social change also depends on sustaining law's function of stabilizing expectations. This constitutes the core of Luhmann's theory of operative closure. We devise three hypotheses to reconstruct IEL's operative closure and apply them to the South China Sea. Hypothesis 1: Environmental impact assessment norms address the problem of contingency management. Hypothesis 2: Due diligence norms address the problem of confidence maintenance. Hypothesis 3: Cooperation norms address the problem of trust retention. Our analysis shows that reconstructing IEL's operative closure reveals its societal responsiveness. This presents a new critical lens for observing IEL's social phenomena.

Keywords: International environmental law; environmental impact assessment; due diligence; cooperation; Social Systems Theory; South China Sea

A. Introduction

This study presents a new critical lens on international environmental law (IEL), moving beyond two common narratives. The first narrative portrays IEL through a "crisis" lens.[1] Critics argue that viewing IEL solely as expressions of state sovereignty leads to exploitative outcomes.[2] Echoing Koskenniemi's critiques, this vulnerability renders IEL an "apology" for its shortcomings.[3] The second narrative adopts an "ambition" lens[4] and embraces concepts like Earth Law[5] and Earth

[1]*See* Leslie-Anne Duvic-Paoli, *International Law: A Discipline of Ambition*, 36 LEIDEN J. INT'L L. 233, 233 (2023).

[2]*See generally* Ugo Mattei & Luigi Russi, *The Evil Technology Hypothesis: A Deep Ecological Reading of International Law*, 2012 CARDOZO L. REV. DENOVO 263 (2012); Surabhi Ranganathan, *Ocean Floor Grab: International Law and the Making of an Extractive Imaginary*, 30 EUR. J. INT'L L. 573 (2019).

[3]MARTTI KOSKENNIEMI, FROM APOLOGY TO UTOPIA: THE STRUCTURE OF INTERNATIONAL LEGAL ARGUMENT 58–70 (2006).

[4]*See* Duvic-Paoli, *supra* note 1, at 234.

[5]*See, e.g.*, Louis J. Kotzé, *Earth System Law for the Anthropocene: Rethinking Environmental Law Alongside the Earth System Metaphor*, 11 TRANSNAT'L LEGAL THEORY 75 (2020); Louis J. Kotzé & Rakhyun E. Kim, *Earth System Law: The Juridical Dimensions of Earth System Governance*, 1 EARTH SYS. GOVERNANCE, Jan. 2019, at 1, https://www.sciencedirect.com/science/article/pii/S2589811619300023 [https://doi.org/10.1016/j.esg.2019.100003]. *See also* Michael C. Leach, *Seeking "Systems" in*

Systems Integrity.[6] It advocates reorienting IEL towards a "planetary perspective" and "geological timescales."[7] While crucial for vision-building,[8] Koskenniemi's warnings remind us these ambitions risk utopianism. Abstract norms may fuel impractical arguments.[9] The tendency to view IEL as "lacking organizational and doctrinal unity"[10] further amplifies problems. Conflicting norms validate crisis claims,[11] while the limited social anchoring of new paradigms reinforces ambition critiques.[12] Though these critiques hold value, such views often lack a systemic account of how IEL develops responsiveness to social interests. Instead, we end up with an "inconclusive jumble of case studies" where it seems nothing "adds up."[13] Simply put, the literature lacks a "central core,"[14] particularly a "theory of society" that underpins every environmental law.[15]

Recognizing the limitations of crisis and ambition narratives in IEL, this study offers an alternative account. It embraces both ambition and modesty[16] to gain independence from accounts that frame IEL solely through these lenses. The study shows modesty by refraining from evaluating whether IEL norms produce morally good or bad outcomes. Its ambition, however, drives it to understand the processes that ensure IEL's continued coherence as a legal system. Through this inquiry, we aim to better understand how IEL addresses problems raised by crisis and ambition narratives. Current narratives use methods like empirical studies[17] or doctrinal

Earth System Law: Boundaries, Identity, and Purpose in an Emergent Field, 15 EARTH SYS. GOVERNANCE, Jan. 2023, at 4, https://www.sciencedirect.com/science/article/pii/S2589811622000313 [https://doi.org/10.1016/j.esg.2022.100162] (interrogating "whether it is an appropriate task or role for [Earth System Law] scholars to be making . . . normative choices for law").

[6]*See generally* Klaus Bosselmann & Rakhyun E. Kim, *International Environmental Law in the Anthropocene: Towards a Purposive System of Multilateral Environmental Agreements*, 2 TRANSNAT'L ENV'T. L. 285 (2013). *See also* Louis J. Kotzé, Louise Du Toit & Duncan French, *Friend or Foe? International Environmental Law and Its Structural Complicity in the Anthropocene's Climate Injustices*, 11 OÑATI SOCIO-LEGAL SERIES 180 (2021).

[7]Louis J. Kotzé & Rakhyun E. Kim, *Exploring the Analytical, Normative and Transformative Dimensions of Earth System Law*, 50 ENV'T POL'Y & L. 457, 465 (2021).

[8]*See, e.g.*, ALEXANDER GILLESPIE, INTERNATIONAL ENVIRONMENTAL LAW, POLICY, AND ETHICS 127 (2000); Andre Nunes Chaib, *Multinaturalism in International Environmental Law: Redefining the Legal Context for Human and Non-Human Relations*, 12 ASIAN J. INT'L L. 82, 82–84 (2022).

[9]*See generally* KOSKENNIEMI, *supra* note 3.

[10]Andreas Fischer-Lescano & Gunther Teubner, *Regime-Collisions: The Vain Search for Legal Unity in the Fragmentation of Global Law*, 25 MICH. J. INT'L L. 999, 1017 (2004). *See also* Oliver Kessler & Friedrich Kratochwil, *Functional Differentiation and the Oughts and Musts of International Law*, *in* BRINGING SOCIOLOGY TO INTERNATIONAL RELATIONS: WORLD POLITICS AS DIFFERENTIATION THEORY 159, 170 (Mathias Albert, Barry Buzan & Michael Zürn eds., 2013) (arguing Fischer and Teubner's concept of "auto-constitutional regimes" forces them to deny the "unity of international law").

[11]*See, e.g.*, Jérémie Gilbert, *Creating Synergies Between International Law and Rights of Nature*, 12 TRANSNAT'L ENV'T. L. 671, 672 (2023) (explaining that rights to exploit natural resources can clash with obligations to protect the marine environment).

[12]Leach, *supra* note 5.

[13]*See* Lawrence M. Friedman, *The Law and Society Movement,* 38 STAN. L. REV 763, 779 (1986)

> ("'To many observers, the work done so far amounts to very little: an incoherent or inconclusive jumble of case studies. There is (it *see*ms) no foundation . . . nothing cumulates. The studies are at times interesting and are sporadically useful. But . . . [n]othing adds up. Law and economics offers hard science; CLS [Critical Legal Studies] offers high culture and the joy of trashing . . . Grand theories do appear from time to time, but they have no survival power; they are nibbled to death by case studies. There is no central core.").

[14]*See id.*

[15]*See* Elizabeth Fisher, *Environmental Law as "Hot" Law*, 25 J. ENV'T L. 347, 352 (2013) (noting that every environmental law has an underlying theory of society and suggesting operative closure as fulfilling this theoretical role). *See also* Ziegert, *infra* note 22, at 58 (substantiating Fisher's claim, demonstrating how the concept provides a universal scientific description of society).

[16]*See generally* Michael King & Anton Schütz, *The Ambitious Modesty of Niklas Luhmann*, 21 J. L. & SOC'Y 261 (1994).

[17]*See, e.g.*, Karin Bäckstrand & Jonathan W. Kuyper, *The Democratic Legitimacy of Orchestration: The UNFCCC, Non-State Actors, and Transnational Climate Governance*, 26 ENV'T POL. 764, 785 (2017).

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analysis.[18] Yet these approaches depend on the "unsustainable belief" that a sound method can capture reliable facts.[19] While valuable, these methods provide only partial insights into IEL's systemic function.[20] As a way forward, we propose using Niklas Luhmann's social systems theory.[21] Luhmann's approach is valuable because it is not a dedicated method but a "thick" sociological account of the legal system.[22] We develop this thick account by formulating three hypotheses about IEL norms. First, however, we explain how operative closure theory shapes our methods for evaluating the South China Sea (SCS) context.

Operative closure theory explains how IEL maintains coherence while addressing system problems.[23] It frames IEL within a legal system, a recursive network of communications[24] that operates according to legal rules.[25] While this orientation, termed "normative closure," creates systemic boundaries, it simultaneously enables IEL to remain cognitively open to new information. Three systemic processes—*variation*, *selection,* and *retention*—help explain this dual functionality.[26] IEL shows its openness by responding to the *varying* demands of science and politics. This reflects IEL's performance in securing possibilities like environmental protection and dispute resolution. However, IEL is never fully open, as it relies on *selecting* normative expectations worth protecting. This relates to law's function of stabilizing some social expectations at the expense of others.[27] Together, these stances reveal the paradox of IEL's operative closure. To *retain* relevance, IEL must grapple with two questions: Are practices sustainable, and are they legal? Sustainability guides IEL's cognitive direction, while legality steers its normative compass. This implies that sustainable adaptation hinges upon IEL upholding law's function of stabilizing expectations.

A sociological method reformulates the problem which IEL functions to address. This means shifting from decision problems to system problems. Decision problems are those faced by scholars and practitioners who directly engage in decision-making. These problems often stem from narrow criticisms of IEL's alignment with capitalism and state interests.[28] Conversely, system problems provide a broader view on recurring issues that shape the long-term continuity of IEL. These system problems are not necessarily operational flaws within IEL. Instead, they arise from

[18]*See, e.g.*, Mbengue, *infra* note 71.

[19]Niklas Luhmann, Trust and Power § 1–2, xx (Christian Morgner & Michael King eds., Howard Davis, Kathryn Rooney & John Raffan trans., John Wiley & Sons 2017) (1979).

[20]*See id.* at 18 (noting that more rigorous methods narrow the aspect of reality accessible to observers).

[21]*See generally* Niklas Luhmann, Law as a Social System 76–141 (Fatima Kastner, Richard Nobles, David Schiff & Rosamund Ziegert eds., Klaus A. Ziegert trans., Oxford University Press 2004) (explaining Luhmann's social systems theory).

[22]Klaus A. Ziegert, *Systems Theory and Qualitative Socio-Legal Research*, *in* Theory and Method in Socio-legal Research 58, 59 (Reza Banakar & Max Travers eds., 2005).

[23]Luhmann, *supra* note 21, at 106.

[24]*See* Andreas Philippopoulos-Mihalopoulos & Thomas E. Webb, *Vulnerable Bodies, Vulnerable Systems*, 11 Int'l J.L. Context 444, 445–46 (2015) (conveying the idea that legal communication encompasses all social exchanges concerning legal matters. When a lawyer and fishers discuss the legality of blast fishing and invoke legal arguments, they operate within the legal system. By contrast, a scientist advising on the ecological impacts of blast fishing participates in the scientific system).

[25]Luhmann, *supra* note 21, at 108–09.

[26]*See, e.g.*, Mathias Albert, *Luhmann and Systems Theory*, *in* Oxford Research Encyclopedia of Politics 1, 8–9 (2019); Luiz Felipe Rosa Ramos, *Rethinking the Functional Method: Law and the Multivalued Function of Competition*, *in* World Society's Law: Rethinking Systems Theory and Socio-Legal Studies 377, 384–85 (Marco Antonio Loschiavo Leme de Barros, Lucas Fucci Amato & Gabriel Ferreira da Fonseca eds., 2020); *see generally* Niklas Luhmann, 1 Theory of Society: Cultural Memory in the Present (Rhodes Barrett trans., Stanford University Press. 2012) (1997).

[27]*See* Ziegert, *supra* note 22, at 67 (noting that this legal function is unique and the only one that researchers can reliably assess and confirm through empirical observation). *See generally* Luhmann, *supra* note 21, at 251–358. *See also* Nicolaas Buitendag, States of exclusion: A Critical Systems Theory Reading of International Law 44 (Nico Buitendag ed., 2022).

[28]*See, e.g.*, Louis J. Kotzé & Sam Adelman, *Environmental Law and the Unsustainability of Sustainable Development: A Tale of Disenchantment and of Hope*, 34 L. & Critique 227, 227–28 (2023).

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the complex relationship between science, law, and politics.[29] Our method constructs this "triangular constellation"[30] to explain how IEL sustains its operative closure. It links various system problems with IEL processes to show how social context informs decision-making. For example, *varying* facts from scientists create a contingency problem for IEL. In response, lawyers *selectively* filter legal expectations to maintain legal confidence. Politicians further require this filtering to uphold state consensus and address trust *retention* problems.

The context of three key IEL norms applied by the 2016 SCS tribunal[31] helps conceptualize IEL's response to these system problems. Section C explores this further, detailing the Philippines' claims that China breached these norms.[32] For now, we treat IEL norms as social facts[33] and use the trinity of systemic processes to steer our hypotheses formulations as follows. Environmental Impact Assessment (EIA) norms[34] address the system problem of contingency. While the SCS has rich biodiversity,[35] environmental problems do not immediately affect IEL. Scientists must verify state claims, often leading to *variant* views. Due diligence norms to protect the marine environment[36] address the system problem of confidence. These norms do not impose an absolute duty to avoid harm, but set expectations for best practices, even when outcomes are disappointing. This means that lawyers and judges may *select* or disregard claims lacking a legal basis to maintain confidence in the legal system. Cooperation norms[37] *retain* scientific and political balance by addressing the system problem of trust.

The SCS offers a useful context to highlight the tensions between scientific and political priorities. Science seeks to minimize risks, while politics focuses on maintaining power.[38] For example, in the SCS tribunal, the Philippines raised environmental disputes as part of its legal claims. While the tribunal affirmed IEL norms, its ruling was unenforced because China claimed a lack of jurisdiction.[39] China claims sovereignty within the "nine-dash line," a region also claimed by Brunei, Malaysia, and Vietnam.[40] This leads us to ask: What is IEL's function in environmental disputes involving disputed territorial claims? Neither the crisis nor ambition perspective provides a sufficient answer. However, the theory of operative closure—applied at a high level of abstraction and generality—provides a conceptual solution. It allows us to compare the elements of each hypothesis and explain how they relate to IEL's operative closure, as demonstrated in the table below.

[29]*See* Daniel Bertram, *'For You Will (Still) Be Here Tomorrow': The Many Lives of Intergenerational Equity*, 12 TRANSNAT'L ENV'T L. 121, 127–28 (2023) (conveying economic considerations play a crucial role in IEL, but they are more directly addressed in economic law. The principle of sustainable development in IEL highlights this distinction. It emphasizes intergenerational equity, aligning with science's focus on long-term trends and ecological resilience instead of immediate economic gains).

[30]GUNTHER TEUBNER, CONSTITUTIONAL FRAGMENTS: SOCIETAL CONSTITUTIONALISM AND GLOBALIZATION 44 (2012).

[31]*See* The South China Sea Arbitration (Phil. v. China), Award, 2016 Perm. Ct. Arb. (July 12), https://pcacases.com/web/sendAttach/2086 [hereinafter *Philippines v. China*].

[32]*Id.*

[33]Chris Thornhill, *On Norms as Social Facts: A View from Historical Political Science*, *in* TRAGIC CHOICES: LUHMANN ON LAW AND STATES OF EXCEPTION 47, 47–49 (William Rasch ed., 2008).

[34]*See* U.N. Convention on the Law of the Sea arts. 204–206, Dec. 10, 1982, 1833 U.N.T.S. 397 [hereinafter UNCLOS].

[35]Keyuan Zou, *Managing Biodiversity Conservation in the Disputed Maritime Areas: The Case of the South China Sea*, 18 J. INT'L WILDLIFE L. & POL'Y 97, 98 (2015).

[36]UNCLOS, *supra* note 34, at art. 192.

[37]*Id.* arts. 123, 197.

[38]*See* Steffen Roth & Anton Schütz, *Ten Systems: Toward a Canon of Function Systems*, 22 CYBERNETICS & HUM. KNOWING 11, 24 (2015) (exploring the functions of science and politics).

[39]Xuequan Mu, *China Reaffirms Non-Acceptance of South China Sea Arbitration*, XINHUA (June 30, 2016), http://www.xinhuanet.com/english/2016-06/30/c_129105084.html.

[40]Zhiguo Gao & Bing Bing Jia, *The Nine-Dash Line in the South China Sea: History, Status, and Implications*, 107 AM. J. INT'L L. 98, 104 (2013).

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Table 1. Interplay Between Hypotheses and IEL's Operative Closure

Hypothesis	Systemic Process	System Problem	Systemic Context	Interplay with Operative Closure
H1: EIA norms incorporate *variant* possibilities to address contingency.	**Variation:** Considering various viewpoints.	**Contingency:** Managing scientific uncertainty.	**Science:** Structured environmental assessment.	**Cognitive Openness:** Facilitates systematic use of scientific variation.
H2: Due Diligence norms *select* expectations to address confidence.	**Selection:** Screening environmental standards.	**Confidence:** Sustaining legal consistency.	**Law:** Developing standards through interpretation.	**Normative Closure:** Enables filtering while sustaining legal stability.
H3: Cooperation norms *retain* learning opportunities to address trust.	**Retention:** Maintaining legal-political commitments.	**Trust:** Sustaining long-term cooperation.	**Politics:** Governance through consensus frameworks.	**Operative Closure:** Strengthens learning by retaining key expectations.

Our formulation of hypotheses is unconventional. The purpose of mapping IEL's operative closure through these hypotheses is not to test whether theory reflects practice. Each hypothesis has biases, and none can fully capture the anarchic nature of IEL,[41] which a crisis lens typically presents. Instead, we use them as a question generating conceptual tool to set a new standard of critique.[42] This standard offers an "immanent" critique, arising from observing how these hypotheses interconnect. While we analyze each separately for clarity, they must be viewed as an interconnected system. Only then can we understand how IEL's operative closure functions at both macro and micro levels.

Macro insights arise from mapping how IEL conserves the specialization of legal communications. For example, hypothesis 1 (H1) proposes that EIA norms enable IEL to manage contingencies by incorporating *variant* viewpoints. Yet, due diligence norms *select* this adaptability to ensure legal certainty (hypothesis 2 (H2)). Furthermore, cooperation norms coordinate between "knowledge and ignorance"[43] to address trust *retention* problems (hypothesis 3 (H3)). Together, these systemic processes reveal IEL's dual capacity. They show how IEL adapts to changing events while sustaining law's role of stabilizing societal expectations.

Micro insights arise from mapping how system problems shape IEL's filtering of legal communications. For example, (H3) demonstrates that unilateral state actions—rather than cooperative approaches—erode trust. This trust deficit directly impairs EIA processes (H1), as decisions become linked to unsustainable practices. Furthermore, a reduced capacity to manage unexpected events can undermine confidence in due diligence norms (H2). These interactions expose how political agendas and scientific uncertainties distort legal outcome predictions. Crucially, they reveal IEL-specific system problems that legal formalism typically masks. The question then is: Under what conditions can IEL manage these system problems while upholding IEL's operative closure?

The following structure guides this study. Section B presents an alternative account of IEL, moving beyond crisis and ambition views. Section C reviews the SCS tribunal for context. Sections D and E formulate three hypotheses about the function of IEL norms. Section F then summarizes by reframing IEL through the critical lens of operative closure.

[41] *See* Douglas Hofstadter, I Am a Strange Loop 101–02 (2007) (using Hofstadter's analogy of a strange loop, we could describe IEL as a purely anarchic system—an analogy which captures the idea of tangled hierarchies, where the highest level of a hierarchy "loops into" the lowest one).

[42] *See* Lyana Francot, *Systems Theory, Critique and Law: To Kill Some Darlings?*, *in* Facts and Norms in Law: Interdisciplinary Reflections on Legal method 150, 151 (Sanne Taekema, Bart van Klink & Wouter de Been eds., 2016) (observing that applying systems-theoretical concepts in a consistent and coherent manner can result in an "immanent" critique) (implying, thus, that the theory of operative closure already includes the potential for a normative critique—the only requirement being a thorough "unearthing" of social systems theory).

[43] Luhmann, *supra* note 19, at 29.

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B. Beyond Crisis and Ambition

Viewing IEL through the lens of crisis or ambition often leads to both conceptual and practical challenges. A crisis lens apologizes for the inability of the doctrinal method to resolve disputes. This apology stems from the inherent limitations of the doctrinal method in addressing broader issues. For instance, numerous doctrinal accounts center on China's alleged breach of specific IEL norms, as ruled by the SCS tribunal.[44] Yet this incident-centric approach yields limited understanding of three broader, intersecting problems challenging IEL. These problems include information, governance, and legitimacy.[45] Limited marine science research creates a substantial knowledge gap. This gap hinders establishing measurable conservation goals for regional seas conventions. Uncertain enforcement follows,[46] raising questions about IEL's effectiveness in preventing exploitation.[47] Proceduralization, with its emphasis on rules on how to proceed, offers a potential answer to these overlapping problems.[48] It underscores rules about time and sequence, in addition to strategy and learning, from social developments. However, the day-to-day legal processes stemming from proceduralization often vanish from a doctrinal perspective. This has led to an underappreciation of IEL's unique function of stabilizing normative expectations.[49]

Conversely, an ambition lens that embraces non-anthropocentric ideals counters the utopianism critique. These ambitions, which aspire to align IEL with a "planetary perspective,"[50] often arise as reactions to moral outrages. Critics argue IEL exacerbates climate injustice.[51] In response, supporters offer compelling alternatives. They propose, for example, that we view oceans as living beings rather than mere objects.[52] The ultimate goal is a just process that democratizes access to oceanic knowledge and identities.[53] These vision-building values are undoubtedly valuable as they inspire innovation. Yet, the more IEL embraces these values, the less predictable and normatively robust the law becomes.[54] This does not diminish valuing efforts to reform IEL. After all, problems require solutions and decisive action. Before acting, however, we must consider the complexities of legal change, which are often overlooked.

The confusion about IEL's function arises partly from crisis and ambition lenses, suggesting legal change emerges through events or paradigm shifts. However, legal systems are not changed solely by such phenomena. For change to occur, a multitude of actors must simultaneously modify their beliefs and actions. This is challenging and unlikely to happen by chance.[55] Legal change is

[44]*See infra* Section C (providing more details on this point).

[45]Heike Krieger & Anne Peters, *Due Diligence and Structural Change in the International Legal Order*, *in* DUE DILIGENCE IN THE INTERNATIONAL LEGAL ORDER 351, 388 (Heike Krieger, Anne Peters & Leonhard Kreutzer eds., 2020) (citing Jochen Rauber).

[46]Alexis Ian P. Dela Cruz, *A South China Sea Regional Seas Convention: Transcending Soft Law and State Goodwill in Marine Environmental Governance?*, 6 J. TERRITORIAL & MAR. STUD. 5, 23 (2019).

[47]*See* Mattei & Russi, *supra* note 2.

[48]*See* Krieger & Peters, *supra* note 45, at 382.

[49]*See* LUHMANN, *supra* note 21, at 76–141.

[50]*See* Kotzé & Kim, *supra* note 5, 7–8.

[51]Louis J. Kotzé, *The Anthropocene, Earth System Vulnerability and Socio-Ecological Injustice in an Age of Human Rights*, 10 J. HUM. RTS. & ENV'T 62, 70–73, 85 (2019).

[52]Michelle Bender, Rachel Bustamante & Kelsey Leonard, *Living in Relationship with the Ocean to Transform Governance in the UN Ocean Decade*, 20 PLOS BIOLOGY, Oct. 17, 2022, at 15, https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001828 [https://doi.org/10.1371/journal.pbio.3001828].

[53]*See* Joachim Claudet, Diva J. Amon & Robert Blasiak, *Transformational Opportunities for an Equitable Ocean Commons*, PROCES. NAT'L ACAD. SCIS., Oct. 13, 2021, https://www.pnas.org/doi/10.1073/pnas.2117033118 [https://doi.org/10.1073/pnas.2117033118].

[54]*See, e.g.*, Inger-Johanne Sand, *The Interaction of Society, Politics and Law: The Legal and Communicative Theories of Habermas, Luhmann and Teubner*, *in* LUHMANN AND LAW 249, 260–61 (Christopher Thornhill ed., 2017).

[55]*See* Leach, *supra* note 5.

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more likely to relate to the complexity of social systems.[56] Accordingly, legal systems may respond to short-term social upheavals, such as war or economic crisis. Legal systems may also respond to long-term processes of social transformation. However, how legal systems respond to such events is determined by law's operative closure. In essence, this refers to how the law confirms social expectations while also upholding law's function of stabilizing expectations. The law accomplishes this by connecting current expectations to how future laws are likely to be applied.[57] Without this connection, an entirely unpredictable future would overwhelm decision-makers with complexity. Some level of predictability and legitimacy are required, which is the law's role.

To reiterate, the law has a unique role: it stabilizes expectations and maintains them even in the face of disappointment.[58] No other system, such as science or finance, can fulfill this function. Yet, this crucial aspect is often overlooked by scholars, who conflate law's function with its performance in achieving regulatory ideals. For instance, they may equate dispute resolution and environmental protection with the function of IEL.[59] Although these views are valid, they present a misleading picture. Firstly, regulatory ideals like environmental protection create the impression that IEL directly resolves issues. In practice, IEL merely equips states with the tools to handle them. Secondly, regulatory ideals are not exclusive to the legal domain. Diplomatic negotiations, which happen outside of formal legal channels, can also resolve disputes. Similarly, financial incentives, such as subsidies for sustainable fishing, can contribute to environmental protection.[60] In short, conflating IEL's function with non-specific legal mechanisms obscures its unique purpose.

The concept of operative closure offers a conceptual remedy. Instead of mixing up regulatory ideals by asking about IEL's specific function, the concept shifts the focus. It explores the conditions IEL needs to meet to fulfill law's general function of stabilizing expectations.[61] IEL can facilitate regulatory ideals, such as dispute resolution and environmental protection. But how can IEL create a semblance of legal order when interests conflict? To answer this question, we must elevate our level of abstraction to observe how system problems shape the continuity of IEL's operative closure. Only by conceptualizing this phenomenon can we understand how IEL develops responsiveness to social interests. This is why Section D connects theory, method, and social context to reconstruct IEL's operative closure. However, first, UNCLOS and the SCS tribunal ruling are reviewed to frame our current study.

C. UNCLOS and the South China Sea Dispute

The United Nations Convention on the Law of the Sea (UNCLOS) offers a legal framework for governing the world's seas and oceans. Often termed the "Constitution for the Oceans,"[62] UNCLOS covers a wide spectrum of issues. These encompass marine environment protection, maritime boundaries, navigation, fisheries, scientific development, and dispute settlement. Relevant to IEL are three UNCLOS norms which form the building blocks within the broader IEL

[56]*See* Oliver Kessler, *The Importance of Ignorance: Non-Knowledge and the Limits of Bayesianism*, *in* ADVANCES IN EVOLUTIONARY INSTITUTIONAL ECONOMICS 143, n.3 Hardy Hanappi & Wolfram Elsner eds., 2008) (citing NIKLAS LUHMANN, *infra* note 158).

[57]BUITENDAG, *supra* note 27, at 44.

[58]LUHMANN, *supra* note 21, at 76–141.

[59]*See, e.g.*, PHILIPPE SANDS & JACQUELINE PEEL, PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW 52–53 (2d ed. 2012). *See also* James A. R. Nafziger, *Basic Functions and Principles of International Environmental Law in the Context of Managing Water Resources*, 39 DENV. J. INT'L L. & POL'Y 381, 389 (2010).

[60]*See generally* Oliver Thébaud et al., *Integrating Economics into Fisheries Science and Advice: Progress, Needs, and Future Opportunities*, 80 ICES J. MARINE SCI. 647 (2023) (explaining various financial incentives and how they affect natural resource use and conservation).

[61]LUHMANN, *supra* note 21, at 76–141.

[62]Tullio Treves, *Introductory Note: United Nations Convention on the Law of the Sea*, U.N. AUDIOVISUAL LIBRARY OF INTERNATIONAL LAW (Jul. 2008), https://legal.un.org/avl/ha/uncls/uncls.html.

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framework. They include the obligation to conduct an EIA,[63] the due diligence to protect the marine environment,[64] and the duty to cooperate.[65] On the one hand, EIA norms facilitate the gathering and analysis of information about the effects of proposed projects.[66] In line with the precautionary approach,[67] these norms serve as crucial tools for environmental governance. Due diligence norms, on the other hand, are substantive standards that require states to follow best practices for protecting the marine environment.[68] To achieve this, states must implement the most widely accepted "appropriate rules" and enforcement methods.[69] Cooperation norms focus on a different area. These are procedural rules that require states to cooperate regionally to protect the marine environment.[70] This cooperation includes developing international environmental agreements and establishing mechanisms for dispute settlement.

The 2016 SCS tribunal—Philippines vs. China—"is a leading case in a new generation of environmental disputes" that occur in "maritime areas."[71] The environmental dispute is one of several legal claims the Philippines made against China. These claims also included the aggravation of the dispute during the arbitration process, the legal status of maritime features, and the source of maritime rights in the SCS.[72] The roots of these claims are in a disputed territory where China lays claim to historical and sovereign rights within the "nine-dash line." However, three other Association of South East Asian Nations (ASEAN) states—Brunei, Malaysia, and Vietnam—also have direct claims to the area.[73] This is contentious because the area holds abundant natural resources for both fisheries and oil extraction.[74] Additionally, the area ranks among the world's most significant biodiversity reservoir regions.[75]

At the tribunal, the Philippines alleged China breached UNCLOS norms and their sovereignty. The Philippines presented fifteen submissions to the tribunal. Submissions eleven and twelve held relevance to IEL. The eleventh submission claimed that China infringed on marine environmental protection obligations. It maintained that China tolerated harmful fishing practices undertaken by Chinese fishing vessels. This encompassed the active support of giant clam harvesting in coral reef locations such as the Huang Yan Islands, or Scarborough Shoal. This claim led to the crushing and deterioration of the surrounding coral reef structures.[76] The twelfth submission relates to China's construction activities on reefs in the Nansha, or Spratly, islands. It maintained that constructing artificial islands, installations, and structures violated China's due diligence obligations. Specifically, China violated its UNCLOS due diligence duty to protect and preserve the marine environment.[77]

[63]*See* UNCLOS, *supra* note 34, at arts. 204–206.

[64]*See id*., art. 192.

[65]*See id*., arts. 123, 197.

[66]*See id*., arts. 204–06.

[67]*See* Meinhard Schröder, *Precautionary Approach/Principle*, *in* Max Planck Encyclopedia of Public International Law (Mar. 2014), https://opil.ouplaw.com/display/10.1093/law:epil/9780199231690/law-9780199231690-e1603. *See generally* Nicolas de Sadeleer, *Chapter 9: The Principles of Prevention and Precaution in International Law: Two Heads of the Same Coin?*, *in* Research Handbook on International Environmental Law 182 (Malgosia Fitzmaurice, David M. Ong & Panos Merkouris eds., 1st ed. 2010).

[68]UNCLOS, *supra* note 34, at art. 192.

[69]*See* Pulp Mills on the River Uruguay (Arg. v. Uru.), Judgment, 2010 I.C.J 17 (April 20), https://icj-cij.org/case/135 [hereinafter *Argentina v. Uruguay*] (providing further insights on the definition of due diligence).

[70]*See* UNCLOS, *supra* note 34, at arts. 123, 197.

[71]Makane Moïse Mbengue, *The South China Sea Arbitration: Innovations in Marine Environmental Fact-Finding and Due Diligence Obligations*, 110 AJIL Unbound 285, 287 (2016).

[72]*See Philippines v. China, supra* note 31, at paras. 823–25.

[73]*See generally* K. Cheeppensook, *Asean in the South China Sea Conflict, 2012–2018: A Lesson in Conflict Transformation from Normative Power Europe*, 17 Int'l Econs. & Econ. Pol'y 747 (2020).

[74]Yao Huang & Pham Tran Vuong, *Fisheries Cooperation and Management Mechanisms in the South China Sea: Context, Limitations, and Prospects for the Future*, 4 Chinese J. Compar. L. 128, 144 (2016).

[75]*See Philippines v. China*, *supra* note 31, at paras. 7–10. *See also* Zou, *supra* note 35, at 97.

[76]*See id.* at para. 897.

[77]See *id.* at paras. 818–20.

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Three key points arise from the SCS tribunal's decision. First, the SCS tribunal upheld due diligence norms to protect the marine environment through the eleventh submission. It found that Chinese fishing vessels had significantly harvested endangered species, and these activities were attributable to the Chinese government.[78] Thus, the tribunal declared China breached its obligations to protect the marine environment.[79] Second, the SCS tribunal upheld EIA and cooperation norms through the twelfth submission. It found that China's construction of artificial islands at the above seven reefs caused "severe, irreparable harm to the coral reef system."[80] It also found that China failed to cooperate with SCS neighbors, specifically by not communicating an EIA of the potential effects.[81] Third, despite the tribunal's affirmation of IEL norms, China did not recognize its findings. China adopted a policy of non-compliance towards the tribunal, asserting it had no jurisdiction over the case.[82] Consequently, the tribunal could not propose remedies for the Philippines due to the unenforced ruling.[83]

This study takes a different approach than addressing the immediate concerns of IEL practitioners. We do not explore the reasons behind non-compliance with IEL norms, nor do we prescribe the ideal content of these norms. Instead, we aim to broaden our perspective and observe IEL through the critical lens of operative closure. This lens seeks to develop a "theoretically consistent and heuristically productive" account of IEL,[84] as explored next.

D. A New Critical Lens: Three Hypotheses

To reconstruct IEL's operative closure and introduce a new critical lens, we propose three hypotheses. These hypotheses encompass the "tightly" interwoven components of theory, method, and the SCS context.[85] The theory of operative closure offers a conceptual map for observing IEL's systemic processes. This theory steers the method of constructing the *variant* system problems that IEL addresses. The method then *selects* sociological issues to generate questions about IEL's function. The context of three key IEL norms, applied by the SCS tribunal, ensures the method *retains* relevance to legal practice.

Theoretically, we draw on the concept of operative closure to present a new transdisciplinary paradigm. This paradigm aids fields such as science, law, and politics understand the processes IEL needs to continue functioning as a legal system. To bridge gaps, we translate diverse ideas into three processes: *variation*, *selection*, and *retention*. Our approach offers three distinct advantages. (1) A theory of operative closure segments IEL's processes for conceptual purposes but keeps them related. (2) A relational perspective provides a macro-level map of how IEL addresses problems while sustaining system coherence. It shows that IEL's processing of *variant* facts depends on how IEL *selects* and *retains* expectations worth protecting. (3) Reconstructing IEL's processes highlights how IEL differentiates itself from fields such as politics. This approach helps illustrate IEL's unique role in stabilizing expectations rather than reducing it to a political tool.

[78] *Philippines v. China*, *supra* note 31, at para. 964. *But see* James Harrison, *Significant International Environmental Law Cases: 2015–16*, 28 J. Env'T L. 533, 548 (2016) (noting that with regards to Philippines' claim that Chinese fishing vessels engaged in using cyanide for blast fishing, the court found there was not sufficient evidence that China's actions fell below the requisite standard of due diligence norms).

[79] *See Philippines v. China*, *supra* note 31, at para. 1203(B)(12).

[80] *Id.* at para. 1203(B)(13)(a).

[81] *Id.* at para. 1203(B)(13)(b).

[82] Mu, *supra* note 39.

[83] Harrison, *supra* note 78, at 548.

[84] Hannes Bergthaller, *Beyond Ecological Crisis: Niklas Luhmann's Theory of Social Systems*, *in* Ecological Thought in German Literature and Culture 119, 129 (Gabriele Dûerbeck, Urte Stobbe, Hubert Zapf & Evi Zemanek eds., 2017).

[85] *See generally* Ziegert, *supra* note 22 (exploring the three research components more in depth). *See also* Morten Knudsen, *Surprised by Method—Functional Method and Systems Theory*, 11 F.: Qualitative Soc. Rsch., Sep. 2010, at 4, https://d-nb.info/124821028X/34.

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Methodologically, we use a sociological approach instead of an essentialist one. Essentialism typically uses a dedicated method, such as the doctrinal method of applying legal norms to facts to solve problems. This applied approach focuses on upholding IEL norms and prescribing their ideal forms. Conversely, our sociological method treats IEL norms as social facts to analyze their function.[86] Here, function means the underlying paradox linked to the system problem we hypothesize these norms address. H1 proposes that disagreements among scientists about *variant* truths reflect the contingency paradox. This leads to a system problem of contingency management, which EIA norms address. H2 proposes that *selecting* expectations worth protecting highlights the structural disposition paradox. This paradox stems from the system problem of confidence maintenance, addressed by due diligence norms. H3 suggests that disagreements among politicians on development policies demonstrate the sustainability paradox. This results in a system problem of trust retention, addressed by cooperation norms. By forming these hypotheses, we gain new insights into how interconnected opposing viewpoints shape paradoxes. This, in turn, stimulates reflection on how paradoxes shape the system problems that IEL norms function to address.

Contextually, our hypotheses aim not to verify alignment with SCS realities. Any hypothesis has prejudices, especially when it compels social complexity to fit its dimensions. Instead, our hypotheses leverage the SCS context to reconstruct how IEL functions operatively closed. Here, we adopt an exploratory approach to empirical material. This involves shifting from high-profile jurisprudence to the low-profile everyday aspects of decision-making. We reason that society experiences IEL norms, primarily not through judicial decisions. International courts seldom settle environmental disputes, and those adjudicated are often insubstantial.[87] Instead, we propose that society experiences IEL norms in two main ways: first, through how paradoxes appear in everyday decisions, which influence the form of IEL system problems; and second, through how IEL norms address these paradoxes that underlie IEL system problems. While paradoxes are generally unsolvable,[88] IEL norms can mitigate them in three ways, as outlined in the table below.

Table 2. The Role of Paradoxes in IEL and the Function of IEL Norms

Paradox	IEL System Problem	IEL Norm Function
Contingency Paradox	Conflicting data makes contingency management challenging	EIA norms absorb paradoxes by incorporating *variation* to manage complexity (H1)
Structural Disposition Paradox	Balancing legal stability with new risks erodes confidence	Due diligence norms displace paradoxes by *selecting* adequately complex consistent decisions (H2)
Sustainability Paradox	Short-term needs vs. long-term goals erode trust	Cooperation norms conceal paradoxes by r*etaining* tacit consensus (H3)

[86]Thornhill, *supra* note 33, at 47–49.

[87]*See, e.g.*, Philippe Sands, *Climate Change and the Rule of Law: Adjudicating the Future in International Law*, *in* The Pursuit of a Brave New World in International Law 114 (2017) (illustrating that international tribunals often grapple with constraints in their jurisdiction and competence; that this is apparent when they tackle environmental disputes which frequently involve a wide range of stakeholders, concerns, and standards; and furthermore, that some nations may be hesitant to accept the authority of global adjudicators or comply with their decisions). *See also* Laurence R Helfer, *Effectiveness in Developing International Law*, *in* The Oxford Handbook of International Adjudication 476, 478–79 (Cesare P.R. Romano, Karen J. Alter & Yuval Shany eds., 2014).

[88]Niklas Luhmann, *The Sociological Observation of the Theory and Practice of Law*, *in* Law, Legal Culture and Society 173, 174 (2018).

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Despite presenting each hypothesis in separation, IEL's operative closure intertwines them. The structural disposition of due diligence norms creates the conditions for EIA norms to absorb the contingency paradox. This then empowers cooperation norms to pacify conflicts stemming from the sustainability paradox. We explore this next by combining our three paradoxes—hypotheses—to stimulate reflection on IEL's operative closure.

I. Hypothesis 1: EIA Norms Function to Address the System Problem of Contingency

Contingency articulates the system problem of undecidability.[89] This arises from the uncertainty inherent in any decision, especially when considering ecological risks. EIAs for offshore oil platforms in the SCS exemplify this uncertainty. Non-linear environmental feedback loops create knowledge gaps that hinder risk analysis.[90] To address this, EIA norms differentiate between formal procedures and informal "old boy" networks.[91] The latter dominate assessments through opaque negotiations, yet their secrecy creates a paradox. While exclusivity maintains their power, it also traps them in inflexible patterns. For instance, restricted data access sustains dominance but prevents adaptation to new risks. In contrast, formal EIA norms demand a "dialogical process"[92] about EIA methods, making them easier to identify and, therefore, change. This is key because even states not ratifying UNCLOS must uphold certain standards, like publishing EIA findings. States must also adapt their practices to comply with legal procedures mandating consultation on EIA processes for proposed projects with considerable environmental impacts.[93]

Not all risks receive equal protection under EIA norms. For instance, consider how EIA norms process risks associated with giant clam harvesting. The intrinsic beauty of giant clams is not the subject of an EIA report. Instead, EIA norms adhere to instruments like the Convention on International Trade in Endangered Species (CITES).[94] This means species listed in CITES Appendix 1 may receive greater protection than those in Appendix 3.[95] However, categorizing endangered species is a double-edged sword. It stabilizes state duties, as shown by the SCS tribunal's decision to apply CITES Appendix 2 strict rules to giant clams.[96] Yet, it also creates problems, such as disputes over classifying giant clams under CITES Appendix 1, which prohibits harvesting.[97]

[89]See Knudsen, *supra* note 85, at 6 (explaining complexity as the condition in which the world harbors more possibilities than are realizable).

[90]Irene S. Fortune, Alethea S. Madgett, Ann Scarborough Bull, Natalie Hicks, Milton S. Love & David M. Paterson, *Haven or Hell? A Perspective on the Ecology of Offshore Oil and Gas Platforms*, 3 PLOS SUSTAINABILITY & TRANSFORMATION, April 18, 2024, at 21, https://journals.plos.org/sustainabilitytransformation/article?id=10.1371/journal.pstr.0000104 [https://doi.org/10.1371/journal.pstr.0000104].

[91]*See* Martti Koskenniemi, *The Place of Law in Collective Security*, 17 MICH. J. INT'L L. 455, 478 (1996).

[92]Neil Craik, *The Duty to Cooperate in the Customary Law of Environmental Impact Assessment*, 69 INT'L & COMPAR. L.Q. 239, 241 (2020).

[93]*See Philippines v. China*, *supra* note 31, at para. 948 (emphasizing that an "environmental impact assessment is a direct obligation under the Convention and a general obligation under customary international law"). *See also* Owen McIntyre, *The Proceduralisation and Growing Maturity of International Water Law: Case Concerning Pulp Mills on the River Uruguay (Argentina v Uruguay), International Court of Justice, 20 April 2010*, 22 J. ENV'T L. 475, 495 (2010).

[94]Convention on International Trade in Endangered Species of Wild Fauna and Flora, Mar. 3, 1973, 993 U.N.T.S 243 [hereinafter CITES]. *See also* David M. Ong, *The Convention on International Trade in Endangered Species (CITES, 1973): Implications of Recent Developments in International and EC Environmental Law*, 10 J. ENV'T L. 291 (1998) (offering further details on how norms adhere to such instruments).

[95]*See* CITES, Appendices 3, *supra* note 94, at 12. (indicating polar bears are listed in Appendix II of CITES. Consequently, the convention does not impose a ban on their commercial trade—a stricter measure reserved for species in Appendix I).

[96]*See Philippines v. China, supra* note 31, at paras. 956–57. *See also* CITES, *supra* note 94 (providing that CITES specifically requires international trade transactions of Appendix-II-listed species to meet certain conditions before the requisite permits for trade are issued—which includes requiring export permits and the possibility for trade quotas to ensure trade will not be detrimental to the species).

[97]*See* Youna Lyons, Mei Lin Neo, Denise Cheong & Hiu Fung Wong, *Managing Giant Clams in the South China Sea*, 33 INT'L J. MARINE & COASTAL L. 467 (2018). *See also* Yoshifumi Tanaka, *The South China Sea Arbitration: Environmental Obligations Under the Law of the Sea Convention*, 27 REV. EUR., COMPAR. & INT'L ENV'T L. 90, 95–96 (2018).

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EIA norms, involving observing and assessing environmental effects,[98] present a paradoxical form of relief. EIA decisions gain perceived comprehensiveness precisely because their foundational criteria remain in principle undecidable. The UN High Seas Treaty[99] exemplifies this contingency paradox. While ratification is voluntary, states cannot ignore the treaty's effects—it reshapes legal expectations. This dynamic pressure compels states to refine EIAs for activities such as island-building in the SCS. First, the treaty amplifies contingency by specifying stricter substantive requirements. Assessments must consider all impacts surpassing "minor or transitory effect on the marine environment,"[100] including cumulative stresses and climate-related damage.[101] Second, the treaty necessitates a "dialogical process"[102] to absorb contingency. This fosters collective learning about both existing knowledge and unknown knowledge. Continuous monitoring protocols and publication of (non)-findings[103] for "poorly understood" activities[104] illustrate this function. Indeed, exhibiting this property of undecidability is essential. Only by acknowledging the limitations of knowledge can an EIA appear more comprehensive.

Conversely, omitting dialogical processes in EIAs creates systemic risks. China may strategically comply with EIA requirements to build environmental credibility. Officials may assert that island-building projects followed scientific protocols.[105] Yet this reduces EIA norms to checkbox exercises, neglecting their contingency paradox. Comprehensive EIAs emerge through communicative engagement with alternative possibilities. This includes evaluating competing scientific models alongside relevant "traditional knowledge" and justifying methodological choices.[106] Challenges emerge when EIAs frame compliance unilaterally. Such narratives find acceptance only within social environments that tolerate restricted communicative frames. However, when ecological anxiety erupts, neither visible controls nor representative performances suffice.[107] Anxiety perpetuates itself as a self-reinforcing medium,[108] escalating when third-party research contradicts official findings.[109] Linking ecological harm to state decisions further reveals ambiguities in due diligence norms.[110] Because these norms allow states flexibility in determining EIA content, loopholes emerge. Resulting indeterminacy fuels interstate disputes over compliance expectations.

Scientific uncertainties further complicate the challenge of managing expectations. Consider an EIA of island-reclamation activities on coral reefs. While metrics like the Coral Health Index[111]

[98]*See* UNCLOS, *supra* note 34, at art. 204.

[99]*See* Intergovernmental Conference on an International Legally Binding Instrument Under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction, *Agreement Under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction*, U.N. Doc. A/Conf.232/2023/4 (Jun. 20, 2023) [hereinafter BBNJ Agreement].

[100]*Id.* art. 30, para. 1.

[101]*Id.* art. 1, para. 6.

[102]Craik, *supra* note 92, at 241.

[103]*See* UNCLOS, *supra* note 34, at art. 204. *See also* BBNJ Agreement, *supra* note 99, at art. 16.

[104]BBNJ Agreement, *supra* note 99, at art. 30, para. 1.

[105]*Transcript of Interview with Ouyang Yujing on China's Construction Activities on the Nansha Islands and Reefs*, China Daily (May 27, 2015), https://usa.chinadaily.com.cn/china/2015-05/27/content_20827364.htm.

[106]*See* BBNJ Agreement, *supra* note 99, at art. 31, para. 1(c) (stating EIAs must utilize "the best available science and scientific information and, where available, relevant traditional knowledge of Indigenous Peoples and local communities").

[107]*See infra* Section D.*III*.

[108]*See* Niklas Luhmann, Ecological Communication 127 (John Bednarz, Jr. trans., The University of Chicago Press 1989) (observing that anxiety "cannot be regulated legally nor contradicted scientifically").

[109]*See*, *e.g.*, Sebastian C.A. Ferse, Peter Mumby & Selina Ward, *Assessment of the Potential Environmental Consequences of Construction Activities on Seven Reefs in the Spratly Islands in the South China Sea*, Permanent Court of Arbitration [PCA] 3 (2016), https://pcacases.com/web/sendAttach/1809.

[110]*See* Section D.*II*. *See also* Shi & Ye, *infra* note 149.

[111]*See* Leopoldo Díaz-Pérez, Fabián Alejandro Rodríguez-Zaragoza, Marco Ortiz, Amílcar Levi Cupul-Magaña, Jose D. Carriquiry, Eduardo Ríos-Jara, Alma Paola Rodríguez-Troncoso & María del Carmen García-Rivas, *Correction: Coral Reef Health Indices* Versus *the Biological, Ecological and Functional Diversity of Fish and Coral Assemblages in the Caribbean Sea*,

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can quantify ecological harm, EIAs also amplify uncertainties. This reflects the probabilistic nature of science.[112] An EIA may find that coral reef restoration could take decades or even centuries.[113] For instance, an EIA might project ecosystem recovery spanning decades to centuries. However, emphasizing probable outcomes can paradoxically erode an EIA's perceived validity—a contingency paradox. Decision-makers desire clear conclusions despite facing multiple probabilities. Consequently, uncertain EIAs often seem insufficiently decisive within legal-political frameworks. This perception enables states to privilege expert opinions supporting their predetermined agendas. The precautionary principle offers a potential corrective mechanism here.

The precautionary principle affirms that uncertainties cannot justify disregarding potential risks.[114] Thus, if the impacts of island reclamation on coral reefs are uncertain, states cannot use this uncertainty as a reason to forego protective measures. Proactive steps like consultations or negotiations are required for safeguarding reefs.[115] However, such requirements can lead to unintended deviation and disorder. States may notify others of marine scientific research findings,[116] yet recipients can easily consent or refuse the offered content.[117] States may consult experts[118] on an EIA's quantitative findings, yet these calculations face obstacles as they are known to be malleable.[119] States may participate in negotiations[120] to exchange data on marine pollution,[121] yet, in the absence of trust, this rarely resolves uncertainties and can become a delaying tactic. Cumulatively, these interactions exacerbate the contingency paradox by overloading institutional decision-making with contested information. The question then arises: How can decision-makers effectively manage the contingency paradox of EIA norms?

In this lies the potential of the legal technique of due diligence norms. This legal technique transforms the contingency paradox into a less harmful, more acceptable contradiction.[122]

II. Hypothesis 2: Due Diligence Norms Function to Address the System Problem of Confidence

Confidence articulates the system problem of managing situations marked by contingency and danger. Consider the Manila Trench's seismic volatility, where an unforeseen earthquake could generate a tsunami with cascading impacts across the SCS. Even if such an event overwhelms

11 PLoS ONE, Nov. 2016, https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0167252 [https://doi.org/10.1371/journal.pone.0167252].

[112]*See* Glenn W. Suter, Lawrence W. Barnthouse & Robert V. O'Neill, *Treatment of Risk in Environmental Impact Assessment*, 11 Env't Mgmt. 295, 295 (1987).

[113]*See Philippines v. China*, *supra* note 31, at para. 982.

[114]*See* U.N. Conference on Environment and Development, *Rio Declaration on Environment and Development*, U.N. Doc. A/Conf.151/26 (Vol. I), Principle 15 (Aug. 12, 1992) (stating that "lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation").

[115]Konrad von Moltke, *The Relationship Between Policy, Science, Technology, Economics and Law in the Implementation of the Precautionary Principle*, *in* The Precautionary Principle and International Law: The Challenge of Implementation 97, 101 (David Freestone & Ellen Hey eds., 1996).

[116]*See* UNCLOS, *supra* note 34, at art. 247.

[117]*See*, *e.g.*, Whaling in the Antarctic (Austl. v. Japan: N.Z. intervening), Judgment, 2014 I.C.J. 227 (March 31) (providing an account of Japan's withdrawal from the International Whaling Commission). *See also* Héloïse Berkowitz & Michael Grothe-Hammer, *From a Clash of Social Orders to a Loss of Decidability in Meta-Organizations Tackling Grand Challenges: The Case of Japan Leaving the International Whaling Commission*, *in* Organizing for Societal Grand Challenges 115 (Ali Aslan Gümüsay, Emilio Marti, Hannah Trittin-Ulbrich & Christopher Wickert eds., 2022).

[118]*See* UNCLOS, *supra* note 34, at art. 289.

[119]Niklas Luhmann, Risk: A Sociological Theory 149 (Rhodes Barrett trans., Aldine de Gruyter 1993) (1991).

[120]*See* UNCLOS, *supra* note 34, at art. 118.

[121]*Id.* art. 200.

[122]Kenneth Kang, *Making Paradoxes Invisible: International Law as an Autopoietic System*, 14 Int'l J.L. Context 315, 315 (2018).

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coastal states, due diligence norms cannot permit a collapse of order.[123] Instead, due diligence norms must relieve liabilities to prevent overwhelming litigation. This applies especially when states could not foresee such dangers or where a clear link between decisions and inflicted damage is absent. The No Significant Harm Principle (NSH) provides a framework for addressing these challenges. While not an explicit legal goal, the principle appears as a due diligence obligation, compelling actors to protect and preserve the marine environment.[124] This substantive "negative duty" often takes the form of if-then conditional formulas. These formulas link specific circumstances to legal consequences, ensuring systematic accountability. If state X breaches duties not to degrade the marine environment, then disappointment is a likely outcome for the involved parties.

Crucially, law's normative symbolism[125] stems from the possibility of disappointment rather than mere compliance. Consider the Philippines' claim that several Chinese vessels harvested endangered species in the SCS.[126] China views the SCS tribunal's ruling as disappointing. China's non-recognition[127] of the tribunal's ruling that China breached due diligence norms exemplifies this.[128] From a legal system standpoint, this breach clarifies due diligence norms. It sets an expectation that due diligence norms will treat breaches as such, regardless of disappointment. A state that permits its vessels to harvest endangered species, even in territorial seas,[129] breaches due diligence norms.[130] The violator may then face explicit criticism, even legal repercussions, for the alleged breach. From the viewpoint of other nations, this breach necessitates others to adjust their expectations. Owing to due diligence norms, ASEAN states can expect others to prevent their vessels from harvesting endangered species. China can also expect disappointment from ASEAN states if they tolerate such practices. Indeed, this potential for disappointment, symbolized by due diligence norms, is the driving force behind IEL. IEL compels states to learn and adapt, even if they are hesitant to accept the authority of international courts such as the SCS tribunal judgment.[131]

Nevertheless, due diligence conditional formulas have inherent structural limitations. Their input-oriented nature prevents them from undermining systemic integration rules.[132] Thus, due diligence norms can only maintain environmental protection as long as they do not conflict with other existing rules.[133] Simply put, due diligence norms are enforceable only if other regulations exist undisrupted. Examples include freedom of navigation and the London Protocol. The former

[123]Lin Lin Li, Qiang Qiu, Zhigang Li & Peizhen Zhang, *Tsunami Hazard Assessment in the South China Sea: A Review of Recent Progress and Research Gaps*, 65 Sci. China Earth Scis. 783, 783 (2022).

[124]*See* UNCLOS, *supra* note 34, at art. 192.

[125]Thomas Beebee, *Can Law-and-Humanities Survive Systems Theory?*, 22 L. & Literature 244, 252 (2010).

[126]*See Philippines v. China*, *supra* note 31, at para. 964.

[127]Mu, *supra* note 39.

[128]*See Philippines v. China*, *supra* note 31, at para. 1203(B)(10)(b).

[129]*See* Harrison, *supra* note 78, at 547–48 (suggesting that the SCS tribunal clarified Article 192 of UNCLOS because the tribunal included the territorial sea, not just the exclusive economic zone, as part of the jurisdictional remit of due diligence norms).

[130]*See Philippines v. China*, *supra* note 31, at paras. 961, 964.

[131]*See*, e.g., Jianping Guo, *The Developments of Marine Environmental Protection Obligation in Article 192 of UNCLOS and the Operational Impact on China's Marine Policy – a South China Sea Fisheries Perspective*, 120 Marine Pol'y, July 21, 2020, at 1, https://www.sciencedirect.com/science/article/abs/pii/S0308597X19308917 [https://doi.org/10.1016/j.marpol.2020.104140] (suggesting that "even though China repeated its non-compliance policy towards the SCS Arbitration, the developments of marine environmental protection obligation made by the SCS Tribunal still had significant operational impact in China's marine policy, especially in China's SCS fisheries policy").

[132]*See*, *e.g.*, Campbell McLachlan, *The Principle of Systemic Integration and Article 31 (3)(c) of the Vienna Convention*, 54 Int'l & Comp. L.Q. 279 (2005); Gabriel Orellana Zabalza, The Principle of Systemic Integration: Towards a Coherent International Legal Order 315–16 (Lit Verlag 2012); Panos Merkouris, Article 31(3)(c) VCLT and the Principle of Systemic Integration: Normative Shadows in Plato's Cave (2015).

[133]*See* UNCLOS, *supra* note 34, at arts. 193, 235.

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grants shipping rights to international users,[134] while the latter permits the disposal of "acceptable" waste.[135] As a result, commercial interests often take priority, as this focus is crucial for maintaining the support of actors involved in IEL. However, this does not mean that commercial interests will completely dominate legal policies. A key question is the extent to which IEL can purge these biases towards commercial interests.

Importantly, purpose-oriented due diligence norms distinguish means from ends to mitigate biases. Their focus on outcomes fosters purpose-oriented "sensibilities,"[136] as shown by the formula: to decide Y to achieve goal X. In the context of due diligence norms' positive duty, this means taking active steps to protect and preserve the marine environment. This approach compels decision-makers to consider legal issues from a universal standpoint.[137] It creates an expectation that states will protect or improve the marine environment's current condition. While due diligence norms do not specify exact actions, they do mandate maximum effort to prevent environmental harm. This includes adopting best-practice procedures, such as establishing formal cooperative scientific organizations.[138] These initiatives, however, might not increase certainty or reliability. Instead, they frequently spur increased demands for information. Excessive information, fueled by "media hype,"[139] can obscure crucial details and hinder decision-making. This is why IEL always pairs "specific sensibilities" alongside "specific stabilities."[140] Ultimately, IEL's ability to respond to social interests depends on its own rules and its normative closure.

To gain this systemic orientation and uphold law's normative symbolism,[141] due diligence norms reduce complexities. They achieve this not by determining the cause of harm, but by ensuring adequately complex consistent decision-making.[142] This confidence-building mechanism protects IEL from unanswerable causality questions. It renders previously irresolvable issues manageable at least within law's realm. Examples include whether states escalated disputes by breaching good-faith obligations,[143] or whether EIAs were communicated with relevant parties.[144] Framing technical legal questions as standardized due diligence norms offers a significant advantage: It enables the law to show that Party B's position conforms to these norms, whereas Party A's does not. Therefore, failure to disclose EIA results would contravene due diligence norms. This is especially true if island-reclamation activities may plausibly cause serious harm.[145] However, this also means that, unless explicitly forbidden, other actions are permitted. For

[134]David Rosenberg & Christopher Chung, *Maritime Security in the South China Sea: Coordinating Coastal and User State Priorities*, 39 Ocean Dev. & Int'l L. 51, 52 (2008).

[135]*See* Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, Annex 1, Nov. 17, 1996 (amended 2006), https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/PROTOCOLAmended2006.pdf.

[136]Luhmann, *supra* note 21, at 146.

[137]*See* Bruno Simma & Dirk Pulkowski, *Of Planets and the Universe: Self-Contained Regimes in International Law*, 17 Eur. J. Int'l L. 483 (2006).

[138]*See* David M. Ong, *The South China Sea Environment: The Need for Formalised Institutional Interaction Between Science, Policy and Law*, *in* Routledge Handbook of the South China Sea 294 (Keyuan Zou ed., 2021).

[139]*See*, *e.g.*, Phuong Hoang, *Domestic Protests and Foreign Policy: An Examination of Anti-China Protests in Vietnam and Vietnamese Policy Towards China Regarding the South China Sea*, 6 J. Asian Sec. & Int'l Affs. 1 (2019). *See generally* Frances Yaping Wang & Brantly Womack, *Jawing Through Crises: Chinese and Vietnamese Media Strategies in the South China Sea*, 28 J. Contemp. China 712 (2019).

[140]Luhmann, *supra* note 21, at 146.

[141]Beebee, *supra* note 125, at 252.

[142]Luhmann, *supra* note 21, at 219.

[143]*See Philippines v. China*, *supra* note 31, at paras. 1172, 1178, 1196 (holding that China had aggravated the dispute in violation of the duty of good faith under Article 300 of UNCLOS by expanding its construction activities in the period since the commencement of the 2016 arbitral proceedings).

[144]*See* UNCLOS, *supra* note 34, at arts. 205, 206. *See also* 1985 Agreement on the Conservation of Nature and Natural Resources art. 14, July 9, 1985, https://agreement.asean.org/media/download/20161129035620.pdf.

[145]*See Philippines v. China*, *supra* note 31, at para. 991 (providing further details on the impact of failing to disclose EIA results).

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example, a state can utilize sovereign rights to exploit its natural resources within reason.[146] This is why states can speak of "effective compliance" and the best practices of sustainable fishery resource exploitation.[147]

Admittedly, the mere adherence to "good" practices and legal regulations does not necessarily mean that due diligence norms are just. In fact, the more states rely on "effective compliance" to justify their actions, the more questionable their legitimacy appears.[148] This is especially true when states contest due diligence norm compliance. China's non-acceptance of the SCS tribunal ruling[149] and its counter-arguments of "best possible efforts"[150] serves as a prime example. However, conflicting expectations do not necessarily lead to chaos. Where confidence is lacking, cooperation norms can offer relief by addressing the system problem of trust.

III. Hypothesis 3: Cooperation Norms Function to Address the System Problem of Trust

Trust is key to risk management, especially for SCS states navigating the paradox of sustainable development. Sustainable development goals anchor IEL[151] by facilitating knowledge exchange.[152] This exchange helps states predict behavior and coordinate actions[153] like SCS fisheries management.[154] However, structural contradictions within these goals can hinder their implementation. Decisions tied to unsustainable practices may erode trust and impede planning. States may subsidize fishing fleets to establish a presence in disputed waters. Sovereignty disputes further weaken efforts to enforce effective fisheries management rules.[155] When one state exceeds fishing quotas in shared waters, others may abandon conservation agreements. This retaliatory cycle erodes trust, dismantling collaborative systems designed to protect ecosystems. Breaking this pattern necessitates entrusting decision-making to competent institutions. Cooperation norms are crucial in this process.

[146]*See* UNCLOS, *supra* note 34, at art. 206.

[147]*See, e.g.*, Elizabeth R. DeSombre, Flagging Standards: Globalization and Environmental, Safety, and Labor Regulations at Sea § 1 (2006); Otto Spijkers & Natalia Jevglevskaja, *Sustainable Development and High Seas Fisheries*, 9 ULR 24 (2013); Ted McDorman, *Port State Enforcement: A Comment on Article 218 of the 1982 Law of the Sea Convention*, 28 J. Mar. L. & Com. 305 (1997).

[148]*See, e.g.*, Douglas Castro, *The Colonial Aspects of the International Environmental Law –Treaties as Promoters of Continuous Structural Violence*, 5 Groningen J. Int'l L. 168 (2017); Mattei & Russi, *supra* note 2.

[149]*See* Yubing Shi & Lin Ye, *Some Observations on the CSIL's Critical Study on the South China Sea Arbitration Awards*, 3 Asia-Pac. J. Ocean L. & Pol'y 332 (2018) (detailing China's position of non-acceptance put forth by the Chinese Society of International Law).

[150]*See* Jianping Guo & Peng Wang, *Due Diligence and Overlooked Evidence in the South China Sea Arbitration: A Note*, 50 Ocean Dev. & Int'l L. 235, 240 (2019) (arguing "[t]he enforcement of law, which does not have to concern the exact incident that led one party to bring a case against the other, is not a state's 'best possible efforts' or 'utmost'").

[151]Frank Biermann, Norichika Kanie & Rakhyun E. Kim, *Global Governance by Goal-Setting: The Novel Approach of the UN Sustainable Development Goals*, 26–27 Current Op. Env't Sustainability 26, 26–27 (2017).

[152]Christine Meschede, *The Sustainable Development Goals in Scientific Literature: A Bibliometric Overview at the Meta-Level*, 12 Sustainability, at 1–2, June 1, 2020, https://www.mdpi.com/2071-1050/12/11/4461 [https://doi.org/10.3390/su12114461].

[153]*See* U.N. Conference on Trade and Development, *New Innovation Approaches to Support the Implementation of the Sustainable Development Goals*, U.N. Doc. UNCTAD/DTL/STICT/2017/4 (May 8, 2017), https://unctad.org/system/files/official-document/dtlstict2017d4_en.pdf.

[154]U.N. Dep't of Econ. & Soc. Affs., The Sustainable Development Goals Report 2022, at 54–55, U.N. Sales No. E.22.I.2 (2022), https://unstats.un.org/sdgs/report/2022/.

[155]Guoqiang Luo & Zhixin Chi, *Conflicts and Challenges of Sustainable Fisheries Governance Cooperation Under the Securitization of the Maritime Commons*, 8 Fishes, at 6, Dec. 21, 2022, https://www.mdpi.com/2410-3888/8/1/1 [https://doi.org/10.3390/fishes8010001]; Minna Yu & Xinyu Liu, *A New Approach to Combating Illegal, Unreported, and Unregulated Fishing: Analysis of the WTO Agreement on Fisheries Subsidies*, 2 Marine Dev., at 6–7, Apr. 7, 2024, https://link.springer.com/article/10.1007/s44312-024-00023-4 [https://doi.org/10.1007/s44312-024-00023-4].

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Cooperation norms facilitate trust by motivating decision-making. They cultivate this by fostering an "economy of consensus"[156] on general problems and rules. Consider the general problem of ecological adaptation and the general rule that "all states involve in cooperation."[157] Everyone agrees because abstract values allow recipients to interpret general commitments to their priorities. Undeniably, such style of declaratory politics leaves much to be desired. However, what is gained from sounding out the capacity for consensus[158] is that it reinforces "mutual commitments"[159]—a prerequisite for trust. It creates expectations that non-cooperation in sea-resource conservation is not one's own mistake, but the fault of others.[160] These mutual commitments further imply that cooperation is necessary even when disagreements arise. Both sides must acknowledge the need to decide on more substantive issues. However, what happens when trust is lacking prior to cooperation?

Specific codes of conduct can offer relief in this situation. For example, Marine Protected Area (MPA) policies prevent species extinction using purpose-oriented formulas.[161] These include rules like catch limits, seasonal bans, and restricted fishing zones to meet goals. Crucially, the policy facilitates trust by emphasizing the positive value of achieving goals over their costs. States might promote MPAs within high seas of the SCS, even if it means adjusting sovereign territorial claims.[162] States might also implement export permits to protect endangered species over the demands of their domestic markets.[163] However, the use of MPAs for environmental protection is not without complexities. Establishing protected zones requires drawing a boundary, highlighting the protection of only specific environments.[164] Protection requires observing and representing marine environments through simplified biodiversity metrics and models.[165] Simplification mediates the processing of different zone uses—for example, no-take zones versus exclusive economic zones.[166] While accepting these risks is ultimately a decision for states, we can see how legal procedures contribute to system stability.

Consider the functionality of legal procedures such as notification, consultation, and negotiations. Notifications[167] function to address *communication* problems. They give states the opportunity to accept or reject content presented, which is essential for states to make informed decisions. Consultations[168] function to address *governance* problems. They aid in making disagreements more

[156]Luhmann, *supra* note 21, at 247.

[157]*See* UNCLOS, *supra* note 34, at art. 123.

[158]Niklas Luhmann, Social Systems 233 (John Bednarz, Jr. & Dirk Baecker trans., Stanford Univ. Press 1996) (1984).

[159]Janne Jalava, *From Norms to Trust: The Luhmannian Connections between Trust and System*, 6 Eur. J. Soc. Theory 173, 183 (2003).

[160]*See* UNCLOS, *supra* note 34, at arts. 197, 123 (providing an example from the SCS tribunal, which found that China breached Articles 123 and 197 via its failure to cooperate with other states in carrying out its land reclamation activities in the South China Sea).

[161]*See* Lyons, *supra* note 97, at 27 (providing further details on applicable MPA policies).

[162]*See, e.g.*, Vu Hai Dang, *Establishing a Marine Peace Park in the Spratlys: An Option for Implementing the Declaration on the Conduct of Parties in the South China Sea*, *in* Power, Law, and Maritime Order in the South China Sea 293 (Tran Truong Thuy & Le Thuy Trang eds., 2015); Hongzhou Zhang, *Fisheries Cooperation in the South China Sea: Evaluating the Options*, 89 Marine Pol'y 67 (2018).

[163]*See* Lyons, *supra* note 97, at 484.

[164]*See* Mark Halsey, *Majesty and Monstrosity: Deleuze and the Defence of Nature*, *in* Law and Ecology: New Environmental Foundations 214 (Andreas Philippopoulos-Mihalopoulos ed., 2011) (arguing that states demarcate boundaries for two main reasons: to foster illusions about providing the minimum habitat required for survival and to help justify continued exploitation of natural resources elsewhere).

[165]*See generally* Lintao Huang et al., *Conservation Priorities for Reef-Building Coral Biodiversity Across Multiple Dimensions in the South China Sea*, 44 Coral Reefs 113 (2025).

[166]*See generally* James Kraska, *The Exclusive Economic Zone and Food Security for Developing Coastal States in the South China Sea*, *in* Building a Normative Order in the South China Sea 116 (Tran Truong Thuy, John B. Welfield & Le Thuy Trang eds., 2019).

[167]*See* UNCLOS, *supra* note 34, at art. 247.

[168]*Id.* art. 289.

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manageable, guided by the scientific standards of risk minimization. Negotiations[169] function to address *legitimacy* problems. They allow a "general readiness to accept, within certain tolerance limits, decisions that are still without content."[170] But what happens if human error causes something unexpected to occur? Under these conditions, states may not necessarily face a fundamental crisis of direction. On the contrary, IEL norms offer numerous directives that minimize the potential for disorientation. This includes the synergy between directives concerning reputation, governance, and legitimacy. EIA norms create conditions that allow institutions to promote a positive ecological reputation. Due diligence norms provide a framework for confirming these social expectations. Cooperation norms mitigate conflicting social expectations by emphasizing "procedural legitimacy."[171]

First, EIA norms influence institutional reputation. As EIAs become more well-known and understood, their impact on public opinion and decision-making grows. States that neglect this factor risk a reputation loss. Maintaining credibility requires diligent review of authorized activities and responsive action addressing impact findings.[172] However, EIA norms do not guarantee complete scientific objectivity. States retain flexibility in determining EIA content.[173] Nevertheless, EIA norms can enhance institutional reputations by ensuring certain expectations are met. They guarantee the expectation that all decisions with potential environmental impacts undergo comprehensive EIAs.[174] They also ensure the expectation that EIAs consider the perspectives of affected states.[175] In essence, EIA norms guarantee the expectation of a dialogical process regarding the scope and methods of proposed EIAs.[176]

Second, due diligence norms establish a framework for future action. This framework emerges from two types of formulas working in tandem: conditional and purpose-oriented. Conditional formulas rely on substantive norms and create a structure of conditions and consequences. If a state breaches its due diligence obligations toward marine environments, it faces legal consequences.[177] These might include environmental remediation or damage compensation. In this way, conditional formulas restrict options by defining forbidden behaviors. Purpose-oriented formulas ensure due diligence norms remain relevant as circumstances change. These formulas operate through procedural norms and focus on the relationship between means and ends. They require states to take proactive measures to protect marine environments, which fosters collective learning.[178] States must consider best practices[179] when selecting their approaches as situations evolve.[180] Paradoxically, this also means that what is not forbidden is allowed, such as a state's right to exploit its natural resources reasonably.[181]

Third, cooperation norms retain trust in decision-making by facilitating confidence in institutions. This trust stems not chiefly from the internal workings of institutions but from how

[169]*Id.* art. 118.

[170]Kang, *supra* note 122, at 322.

[171]Niklas Luhmann, Legitimation durch Verfahren 28 (Suhrkamp Verlag 1993) (1969).

[172]*See* BBNJ Agreement, *supra* note 99, at arts. 35–37.

[173]*See Argentina v. Uruguay*, *supra* note 69, at para. 205

[174]*See, e.g.*, Convention on Environmental Impact Assessment in a Transboundary Context art. 9, Feb. 25, 1991, 1989 U.N.T.S. 309.

[175]*See Report of the International Law Commission to the General Assembly*: *Draft Articles on Prevention of Transboundary Harm from Hazardous Activities*, at art. 9(3), U.N. Doc. A/56/10 (2001), *reprinted in* [2001] 2 Y.B. Int'l L. Comm'n 160, U.N. Doc. A/CN.4/SER.A/2001/Add.1 (Part 2).

[176]Craik, *supra* note 92, at 241.

[177]*See* UNCLOS, *supra* note 34, at art. 194.

[178]*See Philippines v. China*, *supra* note 31, at para. 941 (explaining that this also includes maintaining or improving the marine environment's present condition).

[179]*See Argentina v. Uruguay*, *supra* note 69, at para. 897.

[180]*See* UNCLOS, *supra* note 34, at arts. 123, 197.

[181]*See* UNCLOS, *supra* note 34, at art. 193.

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these norms utilize visible controls.[182] Visible controls compensate for the law's inability to determine substantive outcomes. They achieve this by setting clear procedures for reaching specific results. The obligation for states to regulate relevant entities under their jurisdiction exemplifies this approach. When a UNCLOS signatory fails to control its entities and pollution results, other parties can invoke liability.[183] This is possible because states have recourse to dispute settlement procedures provided by UNCLOS,[184] as shown by the SCS tribunal.[185]

Visible controls also address development divides by promoting standards for capacity-building and technology transfer.[186] These standards equalize access to financial and technological systems. They serve as legal mechanisms enabling developing states to narrow gaps with developed nations. To maintain political acceptability, cooperation norms acknowledge a critical constraint. Cooperative bodies cannot impose standards like technology transfer on developed states. Such imposition would undermine intellectual property rights and subsequent inter-state trust. Therefore, cooperation norms require implementation within state "capabilities" on "mutually agreed terms."[187] This approach defines how cooperative bodies facilitate inter-state trust relations.[188] These bodies do not directly solve problems but empower states to tackle them. They establish decision-making processes that advance inquiry and create new premises amid disagreements. By design, these institutions minimize explicit power struggles[189] while prioritizing open deliberation.

Conversely, cooperative norms can construct an impression of legitimacy by empowering representative performances. China's policies on marine-catch quotas, fuel subsidies, and fisheries trading illustrate such empowerment.[190] These pledges often use representative performances to show progress in ecological conservation. They do so by demonstrating how actions have narrowed the gap between current and desired ecological conditions. The extension of China's fishing moratorium and installation of surveillance equipment post-2016 exemplifies such a demonstration.[191] However, these performances may not be ideal for assessing risk. Political power games and scientific complexities can disrupt even the most well-designed plans. Despite this, representative performances can still create an impression of progress. They can uphold the legitimacy of policy goals, justify actions, and project an image of mutually-beneficial cooperation. Against the prospect of absolute uncertainty,[192] this dynamic has value: It avoids decision paralysis. Constant focus on unpredictability could otherwise hinder practical governance.

[182]Guido Möllering, *Understanding Trust from the Perspective of Sociological Neoinstitutionalism: The Interplay of Institutions and Agency* 17 (Max Planck Inst. Study Soc'ys, Discussion Paper No. 05/13, 2005).

[183]*See* UNCLOS, *supra* note 34, at art. 194. *See also Philippines v. China*, *supra* note 31, at para. 961.

[184]*See* BBNJ Agreement, *supra* note 99, at art. 5 (stating that the treaty shall be interpreted and applied in the context of and in a manner consistent with UNCLOS).

[185]*See Philippines v. China*, *supra* note 31, at para. 897.

[186]*See* BBNJ Agreement, *supra* note 99, at arts. 40, 43.

[187]*Id.* arts. 42–43.

[188]*See* UNCLOS, *supra* note 34, at art. 197.

[189]*See* BBNJ Agreement, *supra* note 99, at arts. 40, 43 (conveying, with the obligatory "shall," Parties' responsibility concerning cooperation, capacity-building, and technology transfer).

[190]Hongzhou Zhang & Mingjiang Li, *Fisheries Governance in the South China Sea: Problems, Progress, and Prospects*, 121 MARINE POL'Y, at 1, Oct. 2020, https://www.sciencedirect.com/science/article/abs/pii/S0308597X20308836?via%3Dihub [https://doi.org/10.1016/j.marpol.2020.104237].

[191]*See*, *e.g.*, Guo, *supra* note 131, at 4 (noting that after the SCS tribunal, from 2017 to 2019, authorities extended the fishing moratorium by one month to 3.5 months).

[192]*See* Kenneth Kang, *Making Use of Paradoxes: Law, Transboundary Hydropower Dams and Beyond the Technical*, 29 L. & CRITIQUE 107, 115 (2018) (explaining absolute uncertainty occurs when Subject A cannot act further. This happens because A cannot connect to Subject B's past actions, current behaviors, or future expectations).

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E. Hypotheses as Tools for Norm Reflection

To reconstruct IEL's operative closure, we developed three hypotheses. Figure 1 presents their cyclical relationship within IEL's operative closure. It demonstrates how each hypothesis addresses a specific system problem: contingency (H1), confidence (H2), and trust (H3). Each connects distinct norms to specific processes: variation, selection, and retention, respectively.

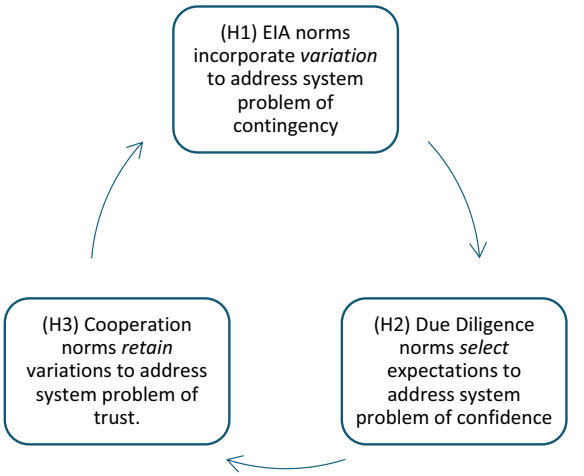

Figure 1. IEL's operative closure and the key elements linking each hypothesis (H)

Unlike conventional methods, we suggest a different approach to formulating hypotheses. Rather than testing them against SCS realities, we focus on connecting theory, method, and context to shed new insights in two key ways.

First, the hypotheses stimulate reflection on how IEL addresses problems while sustaining system coherency. This differs from a crisis narrative that focuses on criticizing IEL's shortcomings. While these criticisms are valid, they often lack a "central core,"[193] a theory of society that underlies every environmental law.[194] As a result, the critique often becomes a reactionary response to problems,[195] rather than a theoretical analysis of how to best frame the problem. In contrast, the hypotheses offer a macro, transdisciplinary map that places IEL's operations on the "same flat playing field"[196] as other systems. This universal framing of problems is possible because all social systems function as operatively closed. They operate by being normatively closed to "why" questions but cognitively open to "how" questions.[197] IEL does not question the reason for using legal inquiries, just as science does not question the use of scientific inquiries. Constantly questioning these fundamental rationalities would lead to system disintegration. Instead, each system focuses on *how* to improve its approach to problems. Ultimately, operative closure shows that normative closure is crucial for any system to be cognitively open.

Second, the hypotheses stimulate reflection on the system problems that IEL norms address. This contrasts with an ambition lens, often criticized for utopianism. An ambition lens typically

[193]Friedman, *supra* note 13, at 779.

[194]Fisher, *supra* note 15, at 352.

[195]*See* Kolja Möller & Jasmin Siri, *Niklas Luhmann and Critical Systems Theory*, *in* THE ANTHEM COMPANION TO NIKLAS LUHMANN 141, 143 (Ralf Rogowski ed., 2023) ("Adorno warned the left against self-betrayal by emphasizing that critical narratives and gestures can become part of a reactionary scheme.").

[196]BUITENDAG, *supra* note 27, at 11.

[197]Susanne Holmström, An Intersubjective and a Social Systemic Public Relations Paradigm: Public Relations Interpreted from Systems Theory (Niklas Luhmann) in Opposition to the Critical Tradition (Jürgen Habermas) 57 (1996) (Public Relations Dissertation, University of Roskilde) (on file with author).

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includes non-anthropocentric ideals, like viewing ocean vitality for all.[198] However, because it focuses on aspirations, an ambition lens often overlooks how system problems inform IEL. In contrast, our hypotheses help explain why the core system problem IEL addresses is the stabilization of expectations.[199] Stabilization does not depend chiefly on the logical consistency of legal doctrine. Instead, stabilization can only be understood laterally, by observing how paradoxes manifest in everyday decisions. This involves unfolding the form in which IEL norms absorb, displace, and conceal three paradoxes that underpin IEL system problems.

I. H1: The Contingency Paradox of Environmental Impact Assessment Norms

H1 provides insight into how EIA norms absorb the contingency paradox. Unlike precautionary risk management methods,[200] H1 refrains from reacting to facts to minimize risk. Instead, H1 explores the schemes in which EIA norms recognize facts by unmasking a contingency paradox. This paradox infers decisions appear more "comprehensive"[201] when EIAs are, in principle, undecidable. H1 explains that EIA norms invalidate EIAs that produce one-sided decisions. Such decisions lack the property of undecidability as they omit evaluation of numerous factors. They therefore lack knowledge, the selection of specific types of observation, and thus comprehensiveness.

Conversely, H1 explains that EIA norms validate EIAs that generate self-reflective learning. These decisions exhibit the property of undecidability as they observe and evaluate numerous factors. This involves facilitating collective learning about knowledge that is both known but also unknown. Accordingly, the potential of EIA norms therefore does not reside in eliminating uncertainty. Rather, it lies in how EIA norms incorporate contingency to cope with complexity. It resides in how EIA norms accentuate specific uncertainties that are more bounded by the risk-minimization standards of science. Yet, this facilitative and cognitive learning-orientation also hinges on due diligence norms' normative closure.

II. H2: The Structural Disposition Paradox of Due Diligence Norms

H2 observes how due diligence norms displace the contingency paradox by generating specific stabilities. This emerges not primarily from determining consistencies within the sources of legal doctrine. Nor does it stem from prioritizing dispute resolution or environmental protection. Rather, it stems from the paradox of sustaining "adequately complex consistent decision-making."[202] Due diligence norms strive for "ecological adequacy"[203] by incorporating best practices like the precautionary principle. This strategy fosters learning and adaptation to meet the complex risk-minimization standards of science. Yet, *consistent* decision-making that aligns with systematic integration rules remains also crucial.[204] Due diligence norms can only maintain environmental protection if they do not clash with other existing rules.

Seen this way, the structural disposition of due diligence norms, characterized by their normative closure, is not ideal. The need for systemic consistency demands tolerating a degree of ignorance towards facts that lack a legal framing. However, H2 helps explains why this is essential.

[198]Claudet et al., *supra* note 53.

[199]*See* Niklas Luhmann, *Organization, Membership and the Formalization of Behavioural Expectations*, 37 SYS. RSCH. & BEHAV. SCI. 425, 427 (2020) (supporting the idea that system problems ultimately stem from problems of expectation stabilization).

[200]*See, e.g.*, Rhett D. Martin & David B. Lindenmayer, *Applying the Precautionary Principle to Hidden Collapse*, 16 SUSTAINABILITY, May 7, 2024, https://www.mdpi.com/2071-1050/16/10/3904 [https://doi.org/10.3390/su16103904].

[201]Mbengue, *supra* note 71, at 287.

[202]LUHMANN, supra note 21, at 219.

[203]Guilherme C. Guimarães, *Public Administration, Law and Development in Brazil: Building Legally Sustainable Public Policies for an Inclusionary State*, 7 L. & DEV. REV. 79, 100 (2014).

[204]*See* McLachlan, *supra* note 132, at 280.

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It reveals that the legal constitution of facts is indispensable to secure legal confidence and certainty. Without this, IEL would forfeit law's presumed ability to settle disputes that arise before it. Due diligence norms' normative closure is the reason IEL can develop cognitive openness to its social context. Due diligence norms (H2) create the conditions for EIA norms to absorb contingencies (H1) and for cooperation norms to pacify conflicts (H3).

III. H3: The Paradox of Cooperation Norms' Sustainable Development Aspirations

H3 illuminates the paradox of realizing sustainable development, a goal both essential and elusive. While sustainability goals promote cooperation and innovation, attaining sustainable development remains a distant prospect.[205] H3 demonstrates how cooperation norms sustain decision-making under such paradoxes. Their efficacy stems not from shared values, but from managing the interplay of knowledge and ignorance. Cooperation norms first employ adaptive mechanisms like technical consultations[206] to adjust to changing situations. These consultations do not solve the sustainability paradox directly. Rather, they guide decision-makers through paradoxical terrains. Consultations allow decision-makers to pinpoint questions and thus learn from and act on specific types of knowledge.

Cooperation norms also function to mask the sustainability paradox by managing specified ignorance. This occurs when these norms legitimize a state's right to "reasonable" natural resource use.[207] Such justification permits decision-makers to overlook certain negative impacts of resource exploitation, thus maintaining perceptions of purposeful action. Trust retention, however, requires balancing learning with non-learning. IEL can create opportunities for adaptation, yet this depends on its operative closure. The capacity of IEL to enhance scientific debates relies on connecting conditions with consequences. This involves linking legal violations— such as failing to share EIA findings—to specific legal repercussions. It also means accepting that IEL may refuse to learn from counterclaims. Even if outcomes prove unfavorable, upholding a semblance of legal order remains crucial for system stability.

The table below synthesizes how each hypothesis employs distinct methods to manage paradoxes within IEL.

Table 3. Paradoxical Dynamics and Systemic Management in IEL

Hypothesis	Paradox Name	Key Binary	How IEL Deals with Paradoxes
H1	Contingency Paradox	Decided/ Undecided	Absorbing paradoxes by embracing undecidability as precondition for comprehensive assessment.
H2	Structural Disposition Paradox	Legal Adaptation/ Stability	Displacing paradoxes through legal mechanisms that balance stability with adaptive capacity.
H3	Sustainability Paradox	Essential/ Elusive Goals	Concealing paradoxes via procedural frameworks that enable decision-making despite fundamental contradictions.

F. Reframing IEL via Operative Closure

Our reconstruction of IEL's operative closure produces a peculiar synthesis of ambitious modesty.[208] This modesty appears as our reconstruction steps back from immediate challenges

[205] *See* Kotzé & Adelman, *supra* note 28.
[206] *See* UNCLOS, *supra* note 34, at art. 289.
[207] *See* UNCLOS, *supra* note 34, at art. 206.
[208] *See* King & Schütz, *supra* note 16.

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facing IEL practitioners. We avoid prescribing ideals for IEL or predicting whether IEL's regulation of the SCS will be catastrophic or progressive. Yet our approach remains ambitious by transcending typical crisis-focused IEL discourse. By linking theory, method, and context, we offer a thick[209] sociological account of processes key for IEL's continued function as a legal system. This foundational approach[210] establishes a new critical standard through three key insights.

First, H1 explores how EIA norms address the system problem of contingency. Unlike approaches relying on human rationality to control uncertainty,[211] H1 exposes the contingency paradox. This paradox reveals comprehensive EIAs require recognizing inherent uncertainty. EIA norms thus prioritize procedural mechanisms over outcomes to process such uncertainty. This procedural focus ensures openness to new evidence and critiques, resisting definitive closure. By mapping how EIA norms institutionalize contingency, H1 thus reconstructs IEL's systemic potentiality. H1 shows how IEL uses contingency to avoid a cul-de-sac, to offer further opportunities, and to encourage further participation.

Second, H2 maps how due diligence norms address the system problem of confidence maintenance. H2 challenges the assumption that new paradigms like Ecosystem Integrity primarily drive change.[212] Change happens because of how systems handle their founding paradox: openness from closure.[213] Law's structural disposition—its systemic design—prioritizes stabilizing expectations to sustain confidence. Due diligence norms conditionally incorporate new paradigms but must also uphold law's stabilizing function. By tracing how these norms displace new paradigms, we map IEL's systemic limits. H2 reveals IEL does not offer substantive resolution to the ecological challenges that new paradigms attempt to solve. Instead, it translates these irresolvable tensions into legally manageable conflicts.

Third, H3 reveals how cooperation norms address the system problem of trust retention. H3 moves beyond critiquing crisis-driven or ambition-focused frameworks. This shift does not ignore crisis narratives about unsustainable practices. Nor does it dismiss visionary narratives about sustainable development necessities. Instead, H3 redirects attention to *how* cooperation norms conceal sustainability paradoxes. The analysis maps how specific IEL processes maintain and construct this concealment. Visible controls show how IEL maintains concealment by linking conditions with legal consequences. Representative performances reveal how IEL constructs ecological progress through legitimizing decisions. By tracing these processes, we map how IEL builds trust in supposedly sustainable practices. H3 emphasizes that sustainability labeling stems not from inherent qualities. Rather, it emerges from deliberate decisions and systemic processes.

Together, these hypotheses offer an immanent critique of IEL by revealing the paradox of operative closure. H1 uncovers foundational dynamics by demonstrating how closure enables openness. It illuminates how IEL's normative frameworks guide its cognitive capacity for adaptation. H2 explicates systemic transformation by revealing how openness depends on normative closure. It shows how IEL's adaptive capacity relies on established normative structures. H3 explores how operative closure demands continuous shifts between openness and closure. Through this account, we develop new critical awareness of how IEL conceals paradoxes. Closure operates through tacit consensus, concealing unsolvable paradoxes. Openness counters with procedural norms that defer substantive resolution. Operative closure leverages this dynamic tension to empower IEL's societal responsiveness, as summarized below:

[209] *See* Ziegert, *supra* note 22.

[210] *See* Krieger & Peters, *supra* note 45 (providing an overview comparing foundational and applied scholarship).

[211] *See* Philip Allmendinger, Planning Theory: Planning Environment Cities (2002) (providing further details on rationalist planning models, which presuppose a guidance center capable of executing fixed goals—a framework which relies on strategic planning methods and "social engineering" as implementational tools).

[212] *See* Bosselmann & Kim, *supra* note 6.

[213] Cary Wolfe, What Is Posthumanism? xxi (2010).

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Table 4. Systemic Dynamics of IEL's Operative Closure

Hypothesis	Systemic Function	Paradox of Operative Closure	Foundational Critique Insight
H1	Manages contingency via EIA norms.	**Closure enables openness**: Procedures institutionalize uncertainty to side-step deadlock.	IEL's adaptation relies on procedural frameworks to navigate indeterminacy.
H2	Stabilizes confidence via due diligence.	**Openness requires closure**: New paradigms depend on existing normative structures.	IEL's function is translation, not resolution, of ecological conflicts.
H3	Retains trust via cooperation norms.	**Operative closure necessitates oscillation:** Tacit consensus conceals openness-closure tensions.	Sustainability labels are systemic constructs, legitimized through iterative legal processes.

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