

Conventions, Compliance, and Safety: Environmental Governance in South and Southeast Asia

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Abstract

Across South and Southeast Asia—a vast maritime theater encompassing the Bay of Bengal, the South China Sea, and the archipelagic waters of Indonesia and the Philippines—the gap between international environmental law and on-water practice is not merely technical but existential. While nearly all states in the region are parties to foundational instruments such as the United Nations Convention on the Law of the Sea (UNCLOS), MARPOL, the Convention on Biological Diversity (CBD), and the Basel Convention, ratification has rarely translated into robust compliance. This article examines why. It argues that the region suffers from a tripartite governance deficit: fragmented domestic legal architectures that vest overlapping and often contradictory mandates in multiple agencies; chronic under-enforcement rooted in scarce technical capacity, inadequate port reception facilities, and the absence of binding transboundary environmental impact assessment protocols; and a deeper political economy of corruption and regulatory capture, where environmental clearance is routinely treated as a negotiable commodity rather than a binding legal obligation.

Through comparative case studies—including ship-breaking in Bangladesh and Pakistan, land-based marine pollution in the Ganges-Brahmaputra delta, illegal, unreported, and unregulated (IUU) fishing across the Andaman Sea, and coastal reclamation under China's Belt and Road Initiative—the article traces how statutory environmental duties are systematically subordinated to commercial and geopolitical priorities. It finds that courts in the region, despite occasional progressive rulings (e.g., recognizing river legal personhood in Bangladesh or applying the writ of *kalikasan* in the Philippines), have yet to embrace core international principles such as the precautionary approach, the polluter-pays principle, or strict liability for transboundary harm. Meanwhile, soft-law regional frameworks—the Bay of Bengal Large Marine Ecosystem (BOBLME) programme, ASEAN's Working Group on Coastal and Marine Environment—remain useful forums for dialogue but lack enforceable compliance mechanisms.

The article then advances a normative legal architecture for reform. It proposes that South and Southeast Asian states adopt a regional framework agreement on marine environmental compliance, anchored in four enforceable pillars: (1) mandatory, transparent, and transboundary environmental impact assessment with independent third-party auditing; (2) harmonized domestic legislation that criminalizes the most egregious forms of marine pollution and IUU fishing with proportionate, dissuasive penalties; (3) a regional compliance commission empowered to receive complaints from affected coastal communities and to issue binding recommendations; and (4) a dedicated capacity-building fund—financed in part by a levy on port and shipping revenues—to close the resource gap that currently renders environmental law a paper promise. Ultimately, this article concludes that without such a legally robust, regionally coordinated, and equitably enforced framework, the environmental governance of South and Southeast Asia will remain a tragedy of the commons: celebrated in international pledges, but systematically failed in the coastal waters where millions live, fish, and drown. Safety at sea and sustainability on the shore are not separate legal problems—they are a single, urgent, and still unmet challenge.

Article History

Received 15 June 2026

Revised 25 June 2026

Accepted 24 July 2026

Published 30 July 2026

OPEN ACCESS

Corresponding Author*

Keywords

Marine environmental compliance; UNCLOS; MARPOL; IUU fishing; transboundary EIA; polluter-pays principle; South-Southeast Asia; regional governance; corruption and enforcement; coastal human rights.

Introduction

South and Southeast Asia's marine spaces—the Bay of Bengal, the South China Sea, and the archipelagic waters of Indonesia and the Philippines—are among the most ecologically productive and legally contested on earth. They sustain over 600 million coastal people, support nearly 30 percent of global fisheries, and serve as the world's busiest shipping corridors. Yet, paradoxically,

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this region has become the epicenter of a persistent governance crisis: one defined not by the absence of international environmental law, but by the systematic failure of law to translate ratification into compliance.

Nearly every state in the region is party to the foundational instruments of marine environmental governance. All have ratified the United Nations Convention on the Law of the Sea (UNCLOS), with its Part XII obligations to prevent, reduce, and control marine pollution. All are signatories to MARPOL, mandating discharge standards and port reception facilities. Most have acceded to the Convention on Biological Diversity (CBD), requiring environmental impact assessment for projects threatening marine biodiversity, and the Basel Convention, which classifies hazardous shipbreaking waste as a controlled substance. Yet ratification has proven a poor proxy for implementation (Reports of the Secretary-General on Oceans and the Law of the Sea. 2025). Vessel-source pollution remains routine in the ports of Chittagong, Jakarta, and Manila. Hazardous shipbreaking continues on the tidal flats of Bangladesh, India, and Pakistan, where 85 percent of global tonnage scrapped in 2025 was dismantled on open beaches, resulting in eleven worker fatalities and sixty-two injuries in a single year (Nieves 2026). Illegal, unreported, and unregulated (IUU) fishing depletes transboundary stocks across the Andaman Sea, while coastal reclamation and port development proceed without meaningful transboundary environmental impact assessment.

The Legal Architecture of Failure

The compliance gap is structural, not accidental. Domestically, the region's environmental governance architectures are fragmented. A comprehensive study of South Asian marine protection reveals that while India has established a relatively comprehensive framework under the Environment (Protection) Act of 1986 and the Coastal Regulation Zone Notification of 1991, implementation remains hampered by weak local enforcement and inconsistent policy standards (Zhang and Wan 2025). Pakistan, despite ratifying over twenty-five multilateral environmental agreements, lacks a unified Coastal Zone Management Act and suffers from substantial shortcomings in environmental impact assessment implementation (Zhang and Wan 2025). Bangladesh, which amended its Territorial Waters and Maritime Zones Act in 2021 to align with UNCLOS, has yet to establish the maritime tribunals promised under Section 27 of that Act, leaving its enhanced pollution control provisions unenforceable and victims unable to seek remedy.

Institutional fragmentation compounds these deficiencies. A recent in-house seminar on ocean governance conducted by the Bangladesh Institute of International and Strategic Studies (BISS) explicitly identified "gaps in coordination, compliance monitoring, data sharing, and enforcement" as the central obstacles to effective marine environmental protection (Md. Muhtasim Faiaz and Preeti Kana Sikder 2026). Across the region, overlapping mandates are assigned to shipping ministries, environment departments, coast guards, port authorities, and fisheries agencies—none of which possess clear statutory primacy or adequate enforcement capacity.

The Jurisprudential Deficit

Even where domestic frameworks exist on paper, the region's judiciaries have consistently declined to embrace core customary international law principles. The precautionary principle—recognized by the International Tribunal for the Law of the Sea in the Southern Bluefin Tuna cases and the

Seabed Disputes Chamber Advisory Opinion—requires that lack of full scientific certainty shall not justify postponing preventive measures where threats of serious damage exist. The polluter-pays principal mandates that those who cause pollution bear the costs of remediation and compensation. Yet across South and Southeast Asia, these principles have been inconsistently applied or explicitly subordinated to developmental priorities.

A deeply consequential illustration is the Supreme Court of India's November 2025 review judgment in *Confederation of Real Estate Developers of India (CREDAI) v. Vanashakti*. The Court, overturning its own prior holding that ex-post facto environmental clearances were "an anathema to the rule of law," reasoned that the precautionary principle must not become "a tool for economic paralysis" and that the polluter-pays principle—implemented through fines and regularization fees—could substitute for prior environmental impact assessment(Sharma 2026a). As legal commentators have noted, this reasoning fundamentally transforms a mandatory ex-ante safeguard into a remedial tax, immunizing completed projects from the harshest consequences of non-compliance(Sharma 2026b). Justice Bhuyan's dissent warned that this approach "demotes the Environment (Protection) Act to a set of suggestions rather than a set of mandates"—a diagnosis that resonates across the region.

The Regional Governance Gap

At the regional level, cooperation mechanisms remain soft-law platforms for dialogue, conspicuously lacking binding dispute resolution or independent compliance auditing. The Bay of Bengal Large Marine Ecosystem (BOBLME) Phase II project (2024-2028) brings together Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka, and Thailand to address transboundary concerns including overexploitation of marine living resources, degradation of critical habitats, and pollution(SEAFDEC 2025). However, as a comprehensive analysis concludes, persistent internal conflicts, lack of mutual trust, limited economic resources, and the absence of strong regional leadership have collectively "constrained the formation and maturation of the Indian Ocean 'Blue Community'(Zhang and Wan 2025)." The region lacks any equivalent to the European Union's Marine Strategy Framework Directive, with binding targets, mandatory reporting, and supranational enforcement.

The Argument and Roadmap

This article argues that the region's compliance gap is a systemic failure at three intersecting levels: domestically, a failure of legal integration and enforcement capacity; jurisprudentially, a failure of courts to consistently apply the precautionary principle and polluter-pays principle; and regionally, a failure to establish binding cooperation mechanisms. Through comparative analysis of shipbreaking, land-based marine pollution, IUU fishing, and Belt and Road Initiative coastal projects, the article advances a regional framework for reform anchored in four enforceable pillars: mandatory transboundary environmental impact assessment with third-party auditing; harmonized domestic legislation criminalizing marine pollution and IUU fishing with dissuasive penalties; a regional compliance commission empowered to receive complaints from coastal communities; and a dedicated capacity-building fund financed by a levy on port revenues(SEAFDEC 2025). Without such legally robust, regionally coordinated mechanisms, the environmental governance of South and Southeast Asia will remain a treaty-rich, compliance-poor tragedy of the commons.

2. Theoretical and Legal Framework

The environmental governance architecture in South and Southeast Asia operates at the intersection of international treaty obligations, domestic legal reception norms, and regionally specific compliance challenges (Brunnée and Toope 2010). Two theoretical lenses are particularly salient for analyzing convention implementation and safety outcomes in this diverse legal landscape: norm internalization theory and the principle of common but differentiated responsibilities (CBDR) (Koh et al. 1997). Together, these frameworks expose a core tension: while multilateral environmental agreements (MEAs) presume uniform compliance, divergent domestic legal architectures and CBDR-based exceptions produce fragmented enforcement landscapes across South and Southeast Asia (Sands et al. 2018).

2.1 Norm Internalization in Dualist vs. Monist Legal Systems in South and Southeast Asia

The effectiveness of international environmental law in South and Southeast Asia depends critically on how states internalize treaty norms within their domestic legal orders (Rajamani and Rajamani 2006). In monist jurisdictions, ratified international treaties automatically become part of domestic law without requiring implementing legislation. Vietnam presents a paradigmatic case: while the constitutional framework formally adopts a monist approach, empirical studies reveal a hybrid model where dualist characteristics persist in judicial practice (Hoang 2025). The judiciary's limited independence and lack of technical legal capacity among lawmakers and judges restrict the direct application of treaty norms, even when formal monism exists (Puno and Gatmaytan 2024).

Conversely, dualist states such as India, Malaysia, and Singapore require express legislative incorporation before international environmental agreements acquire domestic legal force (Boer 2016). This creates inherent implementation delays and gaps between international commitment and domestic enforceability (Koh et al. 1997). In such systems, courts routinely refuse direct application of treaty provisions without enabling legislation, undermining compliance with safety-related protocols under the Basel and Rotterdam Conventions (Sands et al. 2018). The practical consequence across South and Southeast Asia is a fragmented compliance landscape where identical MEA obligations receive divergent domestic legal treatment based on each state's constitutional tradition regarding treaty reception (Brunnée and Toope 2010).

2.2 The Principle of Common but Differentiated Responsibilities (CBDR)

The CBDR principle, enshrined in Principle 7 of the Rio Declaration (1992), structures legal obligations asymmetrically between developed and developing states (Stone 2004). The concept embodies two interconnected elements: "common" suggests that certain environmental risks affect and are affected by every nation, while "differentiated" recognizes that not all countries should contribute equally to mitigation efforts, with developed states ordinarily carrying a greater share of the burden (Rajamani and Rajamani 2006).

In the South and Southeast Asian context, the legal justiciability of CBDR remains contested (Cullet 2015). While the principle justifies differential treatment for least developed countries (LDCs) such as Myanmar, Cambodia, and Nepal, regional courts have not developed coherent jurisprudence on its enforceability as a binding legal standard (Rizky et al. 2020). In transboundary haze litigation, for instance, Indonesia has invoked CBDR to argue for less stringent compliance with the ASEAN

Agreement on Transboundary Haze Pollution(Alvin 2022). However, arbitral tribunals have generally rejected such arguments absent demonstration of disproportionate burden, suggesting that CBDR operates more as a political negotiating tool than a directly enforceable legal obligation in regional environmental governance(Rizky et al. 2020). Recent scholarship on CBDR's application to environmental governance similarly identifies theoretical ambiguities regarding the principle's legal nature, constituent elements, and potential exceptions(Yong and Xin 2024).

3. Compliance with Multilateral Environmental Agreements (MEAs)

The gap between Bangladesh's domestic legal framework for marine environmental protection and its practical implementation is not merely theoretical—it is demonstrably manifest in specific coastal development projects. This section examines four case studies that reveal distinct patterns of procedural non-compliance, each illustrating how legal obligations have been circumvented, subordinated to geopolitical considerations, or rendered ineffective through institutional weakness. These cases move beyond abstract legal analysis to provide concrete evidence that the problem of environmental legal protection in Sino-Bangladesh maritime cooperation is not hypothetical but has already materialized in development practice. The case studies are selected to illuminate different dimensions of legal failure: the complete absence of required environmental assessment, the use of environmental rhetoric as a diplomatic pretext rather than a genuine compliance mechanism, the persistence of illegal fishing despite clear legal prohibitions, and the structural barriers to translating international obligations into domestic enforcement. Together, they demonstrate that the vulnerabilities identified in the previous section are not merely potential risks but active sites of legal breakdown.

3.1 The Basel Convention and Hazardous Waste Compliance: Plastic Waste Governance in Southeast Asia

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (adopted 1989, in force 1992) establishes a prior informed consent (PIC) regime requiring written approval from importing states before hazardous waste shipments may proceed(Environment 2011). Under Article 9, shipments made without proper consent constitute "illegal traffic," which parties must criminalize under domestic law and subject to return obligations(ildirigit 2026a). However, compliance across Southeast Asia has been systematically undermined by waste colonialism, wherein developed states export contaminated waste to less regulated regional ports(Feng 2025).

Indonesia illustrates both compliance deficits and innovative responses. Following China's 2018 waste import ban, Indonesia received over 200,000 tons of plastic waste in 2024 alone, primarily from Australia, Japan, and the European Union(Michael 2025). Despite capping plastic contamination in imported paper waste at two percent since 2006, contamination rates reportedly reached thirty-five percent due to widespread misclassification and weak enforcement(Riliananda 2025). The 2019 Plastic Waste Amendments to the Basel Convention (effective January 1, 2021) reclassified non-hazardous mixed or contaminated plastic waste under Annex II, subjecting it to PIC requirements, while clean, sorted plastic waste for recycling falls under Annex IX outside PIC. In response, Indonesia announced a plastic waste import ban effective January 1, 2025, though critics warn that enforcement depends on treating misclassified "paper waste" shipments with plastic

contamination as "illegal traffic" under Article 9, triggering mandatory return to exporting states(ildigit 2026b).

Malaysia has adopted parallel measures. An amended law effective July 2025 effectively bans plastic waste imports unless approved by the national standards watchdog, with approval limited to waste from countries that have ratified the Basel Convention—effectively barring imports from the United States, which supplied over 35,000 tons to Malaysia in 2024(Newspaper 2025). Nevertheless, enforcement gaps persist, including bribery, collusion among enforcement officers, and smuggling through misclassification, highlighting the limits of unilateral action absent regional coordination. The Asian Network Workshop for Prevention of Illegal Transboundary Movement of Hazardous Wastes (December 2025, Surabaya) reaffirmed the need for continued regional collaboration to combat illegal waste trade, including information sharing on e-waste amendments and plastic waste controls(The Ministry of the Environment (MOE) 2025).

3.2 The Montreal Protocol and Kigali Amendment Compliance: Ozone and Climate Governance

The Montreal Protocol on Substances that Deplete the Ozone Layer (1987) represents a paradigm of successful MEA compliance, largely attributable to its binding phase-out schedules, trade restrictions with non-parties, and the Multilateral Fund providing financial and technical assistance to Article 5 (developing) countries(Environment 2026). In Southeast Asia, all countries have consistently met hydrochlorofluorocarbon (HCFC) phase-out obligations, with National Ozone Units (NOUs) operating under UNEP OzonAction's Compliance Assistance Programme. The Kigali Amendment (entered into force 2019) extends the Protocol's architecture to phase down hydrofluorocarbons (HFCs)—potent greenhouse gases used as HCFC substitutes—creating parallel compliance obligations for the region(UNEP 2021). Compliance under the Kigali Amendment requires robust trade control mechanisms. Thailand has notified the WTO of import licensing requirements for HFCs and HFC-containing mixtures under the Kigali Amendment, justified under GATT Article XX(b) as necessary to protect human, animal, and plant life or health(WTO 2024). The licensing system, established under the Notification of the Department of Industrial Works B.E. 2566 (2023), enables Thailand to track and restrict HFC imports consistent with its phase-down schedule. Regional cooperation has been further strengthened through mechanisms such as the informal Prior Informed Consent (iPIC) system, which enables NOUs to share information on suspected illegal shipments before they cross borders(Environment 2026).

However, compliance challenges remain. The integration of HCFC phase-out with HFC phase-down creates additional administrative and technical burdens for NOUs, including safety concerns regarding flammable refrigerants and the need to engage new stakeholders across the refrigeration and air-conditioning servicing sector. Indonesia has responded by integrating safety standards for flammable refrigerants into technician competency frameworks under its HCFC Phase-out Management Plan, demonstrating how compliance can be achieved through coordinated domestic capacity-building. The Southeast Asia NOU Network Meeting (December 2025, Luang Prabang) further addressed emerging compliance issues including life-cycle refrigerant management, inventories of used and unwanted controlled substances, and coordination with Basel Convention focal points to ensure coherent national approaches to transboundary movement of controlled substances(Environment 2026).

4. Domestic Legal Mechanisms for Environmental Safety

Domestic legal mechanisms form the backbone of environmental safety governance in South and Southeast Asia, translating international treaty obligations into enforceable national standards. However, significant variation exists across the region in terms of judicial accessibility, procedural innovations, and enforcement effectiveness. This section examines two critical domestic legal mechanisms: public interest litigation (PIL) and constitutional environmental rights in South Asia, and specialized environmental courts with innovative writs in Southeast Asia.

4.1 Public Interest Litigation and Constitutional Rights in South Asia

Public interest litigation has emerged as a transformative legal tool in South Asia, expanding access to environmental justice for marginalized communities unable to approach courts through traditional adversarial procedures (Ganegama 2026a). In India, the Supreme Court has expansively interpreted Article 21 of the Constitution (right to life) to encompass the right to a clean and healthy environment, a jurisprudence subsequently adopted by Pakistan and Bangladesh through judicial borrowing (Razzaque 2002). Landmark decisions such as *Shehla Zia v. WAPDA* (Pakistan) and the *Eppawala* case (Sri Lanka) established that environmental hazards constitute violations of fundamental rights, enabling citizens to petition higher courts directly without demonstrating personal legal injury (Ganegama 2026a).

Despite these judicial innovations, significant challenges persist. The procedural informality that enables PIL access also invites judicial overreach and inconsistent enforcement (Ganegama 2026a). Administrative inertia following favorable judgments remains a systemic problem across South Asia, with courts compelled to monitor compliance through continuing mandamus—a practice that strains judicial resources without guaranteeing implementation. Furthermore, except in India, there are no comprehensive guidelines regarding costs and expenses in environmental PIL, nor special funds to support public interest environmental litigation, creating financial barriers for prospective litigants (Razzaque 2002).

4.2 Specialized Environmental Courts and Procedural Innovations in Southeast Asia

Southeast Asian jurisdictions have developed distinctive institutional mechanisms for environmental adjudication, with the Philippines offering the most advanced model. The Rules of Procedure for Environmental Cases (RPEC), adopted by the Philippine Supreme Court, introduced groundbreaking remedies including the Writ of Kalikasan (Writ of Nature) and the Writ of Continuing Mandamus (Programme 2024). The Writ of Kalikasan protects an individual's constitutional right to a balanced and healthful ecology—recognized under Section 16, Article II of the Philippine Constitution—and is available when environmental damage threatens the life, health, or property of inhabitants in two or more cities or provinces (Case Digest 2016). In *Braga v. Abaya* (2016), the Supreme Court clarified the requirements for issuance, holding that the threat of environmental damage must be of such magnitude as to prejudice inhabitants across multiple territorial jurisdictions.

India's National Green Tribunal (NGT), established under the National Green Tribunal Act 2010, represents another specialized model, exercising original and appellate jurisdiction over substantial environmental questions arising from statutes including the Water Act, Air Act, and Environment

Protection Act(V. Srinivasan v Union of India and others. 2012). The NGT applies the principles of sustainable development, precaution, and polluter pays, and is not bound by the Civil Procedure Code, enabling flexible procedures. In *V. Srinivasan v. Union of India* (2012), the NGT set aside an environmental clearance granted for a waste processing plant near Chennai after finding that the EIA consultant had furnished false information regarding the plant's distance from Guindy National Park, demonstrating judicial willingness to sanction professional misconduct in environmental impact assessment processes. However, the NGT's orders remain subject to appeal before the Supreme Court, creating potential delays in final adjudication.

Regional judicial dialogue has further strengthened these mechanisms. In September 2024, the International Commission of Jurists convened a Regional Judicial Dialogue in Bangkok bringing together judges from Cambodia, Indonesia, Lao PDR, Malaysia, the Philippines, and Thailand to discuss improving access to evidence, public interest litigation, and enforcement of court orders in environmental cases(Programme 2024). The Philippines' RPEC was highlighted as a regional model for procedural reform across ASEAN member states.

5. Transboundary Pollution and Maritime Safety

Transboundary pollution and maritime safety present acute governance challenges in South and Southeast Asia, where shared waterways, dense shipping traffic, and seasonal land-based fires generate environmental harms that transcend national jurisdictions. The region's legal architecture comprises global instruments—principally the United Nations Convention on the Law of the Sea (UNCLOS) and MARPOL—alongside regional mechanisms such as the ASEAN Agreement on Transboundary Haze Pollution (AATHP). This section examines two critical dimensions: haze pollution governance under the AATHP framework, and maritime safety and marine pollution control in the Straits of Malacca and Singapore.

5.1 Transboundary Haze Pollution: The ASEAN Agreement and Compliance Challenges

The ASEAN Agreement on Transboundary Haze Pollution (AATHP), adopted in 2002 and entered into force in 2003, remains the only regional legally binding instrument addressing land-based transboundary air pollution from forest and land fires(Murulitharan 2021). The Agreement obligates parties to prevent and monitor fires, respond to emergency situations, and cooperate on cross-border pollution incidents. However, compliance has been persistently undermined by the ASEAN principle of non-interference, which permeates the Agreement's institutional design(Muhammad 2021). Scholarly analysis reveals that while the AATHP carries strong obligations and precision in its substantive provisions, the critical weakness lies in the lack of delegation—dispute resolution remains confined to diplomatic efforts that have consistently produced fruitless outcomes. The Agreement contains no binding enforcement or dispute resolution mechanisms, and only came into full effect in 2014 with Indonesia's ratification(Murulitharan 2021).

The 2015 Southeast Asia haze episode was estimated to have caused between 40,000 and 100,000 deaths across the region, with the World Bank calculating Indonesia's economic losses at US\$5.2 billion across agriculture, industry, trade, and transportation sectors. In response, legal scholars have proposed institutional innovations, including the creation of a specialized ASEAN Transboundary Haze Court with central authority to impose sanctions upon perpetrators of forest and land fires that cause transboundary haze pollution(Kusniati et al. 2024). Such a court would address the

fundamental gap in the current framework: while Indonesia and Thailand have provided domestic sanctions for land-based fire perpetrators under national law, these legal instruments work only domestically and fail to address the transboundary effects of such fires. Operationalizing Article 17 of the AATHP—which mandates scientific and technical research programmes—through the establishment of an independent ASEAN Panel of Technical and Scientific Experts, modelled on the Montreal Protocol's assessment panels, could further depoliticize data disputes and enhance evidence-based cooperation (Murulitharan 2021).

5.2 Maritime Safety and Marine Pollution Control: UNCLOS, MARPOL, and Regional Cooperation

The Straits of Malacca and Singapore constitute one of the world's busiest and most strategically vital shipping lanes. Article 43 of UNCLOS imposes a tripartite obligation on littoral states (Indonesia, Malaysia, Singapore) and user states to cooperate in maintaining navigational safety and protecting the marine environment (Caminos and Cogliati-Bantz 2014). The legal regime of straits under UNCLOS Part III establishes a carefully calibrated balance between the sovereignty of states bordering straits and the right of transit passage, with international cooperation for pollution prevention explicitly mandated under Article 43. The Cooperative Mechanism, established in 2007, operationalizes this provision through the Cooperation Forum, the Project Coordination Committee, and the Aids to Navigation Fund.

Under MARPOL Annex V (garbage from ships), the International Maritime Organization has intensified regional capacity-building through the Marine Environment Protection of the South-East Asian Seas (MEPSEAS) project. Delegations from Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand, and Vietnam have reiterated their commitment to implementing high priority IMO conventions, with special emphasis on MARPOL Annex V given the major threat posed by plastic pollution in the region—one of the planet's worst affected areas (IMO 2020). The project's capacity-building component focuses on compliance, monitoring and enforcement, including developing administrative procedures for port State control and flag State implementation.

Notwithstanding these advances, significant compliance gaps persist. Research on Indonesian implementation of MARPOL Annex V identifies three primary issues: low crew awareness due to inadequate training, limited port waste reception facilities, and weak supervision and law enforcement by maritime authorities, with only 30% of surveyed vessels meeting waste segregation and disposal requirements (Wanadi et al. 2025). A 2021 study of Laem Chabang port in Thailand similarly documented challenges in plastic waste management at seaport reception facilities, including insufficient space for waste monitoring infrastructure and inadequate coordination between port authorities and government oversight organs (Kusniati et al. 2024). These findings underscore the persistent gap between international legal commitments and domestic enforcement capacity across Southeast Asian maritime jurisdictions.

6. Non-State Actors and Compliance Monitoring

Non-state actors—including environmental non-governmental organizations (ENGOS), shareholder activists, and corporate entities—have emerged as critical agents in environmental compliance monitoring across South and Southeast Asia. Operating at the intersection of informal regulation, public shaming, and strategic litigation, these actors fill governance gaps where state enforcement

remains weak or politically constrained(Tang et al. 2024). This section examines two key dimensions: the role of ENGOs in monitoring corporate and state compliance, and the rise of ESG-related litigation and corporate accountability mechanisms.

6.1 Environmental NGOs as Informal Regulators and Compliance Monitors

Environmental NGOs in South and Southeast Asia perform essential monitoring functions that supplement formal state regulatory mechanisms. Research from China, based on a nationwide randomized controlled trial, establishes a causal link between NGO monitoring and improved corporate environmental compliance: companies significantly enhanced their environmental information disclosure after being alerted to NGO scrutiny, with both the threat of regulatory reporting and market exposure proving effective compliance drivers(Tang et al. 2024). This "informal regulation" model reduces government oversight costs while increasing the visibility of corporate performance to stakeholders.

In Southeast Asia, the Environmental Democracy Observatory (EDO), launched by the Westminster Foundation for Democracy in collaboration with Universitas Gadjah Mada, has systematically assessed environmental governance across eight ASEAN member states. The EDO framework evaluates three interlocking rights enshrined in Principle 10 of the 1992 Rio Declaration—access to information, public participation, and access to justice—finding that while legal frameworks exist on paper, implementation gaps persist due to resource constraints, weak enforcement, and closing civic space(Wijayanti 2025).

However, ENGOs increasingly face legal and political constraints. In India, the Income Tax Department has cancelled Foreign Contribution Regulation Act (FCRA) licenses of multiple environmental NGOs—including the Centre for Policy Research, Environics Trust, and Legal Initiative for Forest and Environment—alleging that foreign funding was used to "stall economic and development projects" and target corporate entities including the Adani Group and JSW(Sarin 2024). Legal experts characterize these actions as part of a broader "crackdown on civil society organizations perceived to be critical of the government," noting that over 20,000 NGOs have been struck off FCRA provisions(Tandon 2024). The Supreme Court has previously held that supporting legitimate public dissent "cannot deprive an organization of its legitimate right of receiving foreign contribution," yet enforcement agencies continue to scrutinize ENGOs engaged in environmental advocacy.

6.2 Political Economy, Corruption, and the Capture of Enforcement

The rise of environmental, social, and governance (ESG) litigation represents a transformative development in non-state actor-driven compliance monitoring. In India, the Securities and Exchange Board of India has mandated Business Responsibility and Sustainability Reporting (BRSR) for the top 1,000 listed companies, while Section 166(2) of the Companies Act 2013 imposes a statutory duty on directors to act "in the best interests of the company, its employees, the shareholders, the community and for the protection of environment"(Chandra and Samanta 2025). Nevertheless, research reveals significant implementation gaps: textual analysis of BRSR disclosures by major public sector undertakings found that some companies rely on rhetoric, omit critical risks such as carbon emissions, and lack measurable ESG goals—suggesting a "compliance-driven mindset" rather than genuine accountability.

In Malaysia, the forest monitoring organization RimbaWatch initiated a landmark judicial review in December 2025 against two government ministries, challenging their refusal to investigate allegedly misleading "carbon neutral" claims by a fossil fuel company. This represents Malaysia's first climate litigation case, focusing on whether "greenwashing" violates the Environmental Quality Act 1974 and the Consumer Protection Act 1999(Lin 2026). Analysts predict that a successful judgment would compel the government to adopt a Green Claims Guideline modeled on Singapore and UK frameworks, fundamentally altering how corporations substantiate environmental marketing claims across energy, plantation, and banking sectors.

Globally, ESG litigation has tested corporate accountability boundaries. In *ClientEarth v. Shell plc* (2023), the High Court of England and Wales refused permission for a derivative action alleging that Shell's directors breached their duties under the Companies Act 2006 by failing to prepare the company for the net-zero transition mandated by the Paris Agreement. The court declined to interfere with director decision-making absent a *prima facie* case, illustrating the judicial deference that campaigners face in converting environmental advocacy into legal success(Greene and Simpson 2023). In contrast, the Supreme Court in *Jalla v. Shell* (2023) ruled that the ongoing presence of oil following the Bonga spill did not constitute a "continuing" private nuisance, limiting the limitation period for claims by 27,800 Nigerian claimants.

An OECD report examining sustainability-related disclosures across eight Asian jurisdictions (including India, Indonesia, Singapore, and Vietnam) defines "sustainability washing" to encompass both intentional misrepresentation (disinformation) and negligent disclosures due to inadequate governance systems (misinformation). The report notes that while private enforcement remains limited due to procedural constraints and weak shareholder litigation culture, regulators have taken an active role through infringement notices, fines, and scrutiny under securities and consumer protection laws(IICA 2025).

7. Comparative Analysis: South vs. Southeast Asia

The environmental governance landscapes of South and Southeast Asia, while sharing colonial legal legacies and developing country status, exhibit divergent trajectories in constitutional design, judicial innovation, and enforcement capacity. South Asia has pioneered public interest litigation (PIL) and constitutional environmental rights through judicial activism, whereas Southeast Asia has developed specialized environmental courts and procedural innovations such as the Writ of *Kalikasan* in the Philippines. This section compares two critical dimensions: constitutional environmental rights and PIL in South Asia versus specialized environmental adjudication in Southeast Asia, followed by an analysis of enforcement capacity and governance effectiveness across both regions.

7.1 Constitutional Environmental Rights and Public Interest Litigation in South Asia

South Asian jurisdictions have progressively broadened environmental rights through judicial interpretation of existing constitutional provisions, creating a distinctive model of environmental constitutionalism driven by PIL(Ganegama 2026b). In India, the Supreme Court has expansively interpreted Article 21 (right to life) to encompass the right to a clean and healthy environment, a jurisprudence subsequently adopted across the region through judicial borrowing. Landmark

decisions such as *Shehla Zia v. WAPDA* (Pakistan) and *Bulankulama v. Secretary, Ministry of Industrial Development* (the Eppawala case, Sri Lanka) established that environmental hazards constitute violations of fundamental rights, enabling citizens to petition higher courts directly without demonstrating personal legal injury (Ganegama 2026b).

The SAARC countries share the constitutional recognition of a right to a clean environment, though through different doctrinal routes. Newer constitutions in Afghanistan, Bangladesh, Bhutan, the Maldives, and Nepal contain explicit environmental rights provisions, whereas older constitutions in India, Pakistan, and Sri Lanka have had such rights read into existing rights such as the right to life through judicial interpretation (Alam 2024). This cross-fertilization of environmental law within SAARC illustrates how shared constitutional mechanisms—particularly Directive Principles—have facilitated the regional diffusion of environmental jurisprudence.

Notwithstanding these judicial innovations, significant challenges persist across South Asia. The procedural informality that enables PIL access also invites judicial overreach and inconsistent enforcement. Administrative inertia following favorable judgments remains a systemic problem, with courts compelled to monitor compliance through continuing mandamus—a practice that strains judicial resources without guaranteeing implementation. Furthermore, except in India, there are no comprehensive guidelines regarding costs and expenses in environmental PIL, nor special funds to support public interest environmental litigation, creating financial barriers for prospective litigants (Alam 2024).

Recent empirical research confirms that South Asian courts have produced tangible legal outcomes through PIL, including the suspension of environmentally harmful development projects, judicially mandated pollution controls, and the recognition of precautionary and public trust principles (Ganegama 2026b). However, the long-term effectiveness of these judicial interventions is constrained by inconsistent enforcement, administrative inertia, and delays in compliance, indicating that PIL's transformative potential depends heavily on institutional follow-through.

7.2 Specialized Environmental Courts and Institutional Capacity in Southeast Asia

In contrast to South Asia's PIL-driven model, several Southeast Asian jurisdictions have developed specialized environmental courts and tribunals (ECTs) as institutional mechanisms for environmental adjudication. The Philippines offers the most advanced model, with the Rules of Procedure for Environmental Cases (RPEC) introducing groundbreaking remedies including the Writ of Kalikasan (Writ of Nature) and the Writ of Continuing Mandamus, which protect the constitutional right to a balanced and healthful ecology recognized under Section 16, Article II of the Philippine Constitution (APCEL 2025a).

India's National Green Tribunal (NGT), established under the National Green Tribunal Act 2010, represents another specialized model operating within the South Asian context, exercising original and appellate jurisdiction over substantial environmental questions arising from statutes including the Water Act, Air Act, and Environment Protection Act. However, a recent evaluation of the NGT using the International Framework for Court Excellence's ten core values—including equality, accessibility, fairness, judicial independence, competence, and timeliness—reveals a mixed picture. While the NGT has promoted environmental justice by integrating scientific expertise with legal decision-making and adopting an active problem-solving approach, structural challenges have undermined its effectiveness, including questionable bench appointments affecting judicial

independence, appealed and overturned judgments, procedural overreach, and delays in case disposal(Lei et al. 2023a).

Indonesia presents a distinctive case of institutional adaptation. The aspiration to establish environmental courts has existed for more than two decades, particularly since the fall of the Suharto regime. Rather than approving new environmental courts—seen as politically, legally, and financially too challenging—policymakers instead introduced an environmental judicial certification system. Under this system, judges from civil and administrative courts undergo several months of training in environmental law, and every environmental case must be heard by at least one certified judge. The Supreme Court can deploy certified judges to courts lacking such expertise(Lei et al. 2023b).

Econometric evidence comparing environmental sustainability outcomes across both regions confirms that good governance directly promotes environmental sustainability and indirectly facilitates it by jointly reducing environmental problems along with environmental and energy-related technological innovations. Importantly, the prospects of achieving environmental sustainability are certified to be relatively higher across Southeast Asia compared with South Asia.

8. Barriers to Effective Compliance

Notwithstanding the proliferation of environmental treaties, domestic legal mechanisms, and institutional innovations across South and Southeast Asia, effective compliance remains elusive. Empirical evidence and judicial observations identify two pervasive barriers: corruption and state capture, which systematically undermine enforcement; and institutional capacity deficits, including understaffing, lack of technical expertise, and weak judicial specialization. These barriers operate synergistically, creating compliance traps where legal commitments exist on paper but remain unimplemented in practice.

8.1. Corruption, State Capture, and Regulatory Discretion

Corruption constitutes a fundamental barrier to environmental compliance across South and Southeast Asia, operating through multiple channels including bribery, regulatory capture, and the shadow economy. Econometric evidence from six South Asian countries (Pakistan, India, Nepal, Bangladesh, Sri Lanka, and Bhutan) for the period 2004-2018 demonstrates that corruption significantly and negatively impacts environmental sustainability, with the shadow economy further exacerbating ecological degradation through unregulated resource extraction and waste disposal(Khurshid et al. 2024). The Transparency International Corruption Perceptions Index reveals that, except Bhutan, all seven South Asian countries scored 40 or below out of 100, indicating pervasive institutional corruption that facilitates unlawful environmental operations.

In India, empirical research examining pollution enforcement in Maharashtra's sugar industry—classified among India's "17 Grossly Polluting Industries"—reveals how political connections shape regulatory outcomes. Using a natural experiment created by an unanticipated 2022 political crisis that reshuffled cabinet power, researchers found that mills that lost cabinet access received nearly 12 percentage points more violation notices from the pollution control board—a near doubling of enforcement intensity—while mills that gained new cabinet access showed no change(Ghosh 2025). Critically, the increase in enforcement was driven entirely by discretionary inspections conducted at the regulator's own judgment, while non-discretionary inspections required by law remained

unchanged, demonstrating that enforcement responds to political incentives rather than underlying compliance behavior.

Indonesia presents an acute case of corruption embedded in resource extraction industries. The Corruption Eradication Commission (KPK) has successfully prosecuted high-level political corruption, yet corruption remains pervasive in nickel ore mining and palm oil farming—sectors critical to both Indonesia's economy and global climate transition (Haynie 2024a). A 2016 investigation found that nearly 40% of mining operations should have been deemed ineligible to operate due to failures to meet anticorruption and transparency standards, reaching 73% in some regions. Bribes to "legalize" non-compliant mining operations can be purchased for approximately \$380,000, while local law enforcement agencies decline to enforce restrictions on illegal mines thanks to "coordination fees" paid on a per-ton basis. Despite resource sector corruption producing more than three times the state losses of corruption in financial and utility sectors combined, as of 2020, such cases represented little more than 6% of KPK prosecutions, reflecting institutional risk aversion and the complexity of prosecuting corporate actors operating through opaque cross-border shell company arrangements.

Pakistan's experience further illustrates the corruption-climate nexus. Corruption drains up to 6.5% of GDP annually, while climate disasters cost an estimated 9.5% of GDP each year, together representing combined annual economic losses exceeding 15% of GDP (Abubakar 2025). The 2022 floods—which affected 33 million people—exposed how substandard embankments built through kickback-laden contracts failed catastrophically, with contractors using substandard materials while billing for reinforced structures and inspection reports falsified by complicit officials. Elite capture of irrigation authorities diverts water to politically connected landowners growing water-intensive crops during droughts, creating conditions where natural climate variability becomes social catastrophe (Khurshid et al. 2024).

8.2. Institutional Capacity Deficits: Understaffing, Expertise Gaps, and Judicial Constraints

Institutional capacity deficits across both regions severely constrains environmental compliance. In India, the Supreme Court's April 2025 hearing on the Delhi-NCR pollution crisis revealed systemic institutional failures: out of 603 sanctioned posts in the Central Pollution Control Board (CPCB), 134 remain vacant; state pollution control boards are critically understaffed with frequent transfers of member secretaries—in some cases serving as little as fifteen days—and Delhi has utilized only 30% of funds sanctioned under the National Clean Air Programme since 2019 (Shah 2025). The Court observed that the Air Act mandates that at least two members possess special knowledge or practical experience in air quality matters, yet this statutory requirement remains unfulfilled, leaving pollution boards "toothless".

The National Green Tribunal (NGT) in India, established under the NGT Act 2010 to combine legal and ecological expertise, faces its own expertise deficit. An investigation found that nine of the 13 expert members appointed since 2016 previously held senior positions in the environment ministry, raising concerns about conflict of interest and institutional propriety given the tribunal's appellate jurisdiction over government decisions. Expert positions in the NGT have rarely been filled, forcing benches to function without the technical acumen envisioned by the law, and the pool of experts has been drawn largely from the Indian Forest Service rather than from scientists, economists, engineers,

urban planners, and legal scholars. This expertise deficit has contributed to uneven decision-making and raised questions about the NGT's ability to independently evaluate scientific claims.

Across Southeast Asia, specialized judicial bodies for environmental cases face similar constraints. While Malaysia and the Philippines have designated environmental courts, Thailand has a Green Bench in the Supreme Court, and Indonesia has a certification program for environmental judges, these specialized mechanisms were not established as statutory bodies to expedite cases but are administrative designations within existing courts, facing the same challenges as traditional courts: limited resources, slow processes, and lack of expertise. Environmental litigation commonly takes several years, burdening plaintiffs and discouraging engagement, particularly for those lacking resources. In the Philippines, where the Rules of Procedure for Environmental Cases have been established, some judges have raised the burden of proof to prevent an influx of cases (Kim, Opportunities, and Canales 2025a).

The September 2024 Regional Judicial Dialogue in Bangkok, convening 29 judges from Cambodia, Indonesia, Laos, Malaysia, the Philippines, and Thailand, identified common procedural impediments including low-quality evidence, complex scientific data, overlapping jurisdictional challenges between civil, criminal, and administrative courts, and lack of judicial specialization (RWI 2024). Legal advocates across the region are mobilizing capacity-building and knowledge-sharing opportunities, including lawyer and judge networks providing technical training on environmental adjudication, yet the region has few public interest lawyers specializing in environmental matters, and they face threats when engaging in litigation.

9. Pathways to Strengthen Legal Compliance and Safety

Addressing the persistent compliance gaps documented across South and Southeast Asia requires a multi-pronged legal strategy that moves beyond treaty ratification toward enforceable implementation. Emerging pathways cluster around two complementary approaches: technological integration in enforcement, leveraging satellite remote sensing and artificial intelligence for compliance monitoring; and institutional and procedural reforms, including specialized environmental courts, regional legal frameworks, and evidence-based judicial capacity building. These pathways, while distinct, operate synergistically to transform environmental governance from paper commitments to verifiable outcomes.

9.1. Technological Integration: Remote Sensing, AI, and Evidence-Based Enforcement

The integration of satellite remote sensing and artificial intelligence (AI) into environmental enforcement represents a transformative pathway for strengthening legal compliance across South and Southeast Asia. In India, the Karnataka High Court's 2026 suo motu public interest litigation on illegal sand mining has catalyzed judicial consideration of AI-optimized satellite evidence under the Mines and Minerals (Development and Regulation) Act 1957. Research demonstrates that machine learning-based classification systems—including Support Vector Machines and Random Forests—can identify illegal mining activities with increased precision and transparency, enabling remote sensing-based compliance audits and AI-based reporting of violations through District Mineral Foundations (Kim, Opportunities, and Canales 2025b). The study identifies, however, certain

limitations in current legislation regarding the admissibility of remotely sensed evidence, proposing targeted amendments to regulate illegal mining through technology-based judicial monitoring.

In Bangladesh, the "Evidence for Accountability" pilot project, implemented through the Frontier Tech Hub and Youth Policy Forum, has pivoted from a government-facing technology-push model to a people-centered accountability tool. Recognizing that the core bottleneck was not the absence of environmental data but the breakdown in the "evidence-to-action" chain, the project is developing an AI-assisted learning and reporting tool that empowers affected community members. The tool combines a Bangla-first, anonymous reporting interface with an AI chatbot trained on a bespoke dataset of environmental laws, policies, and encroachment case precedents, providing plain-language guidance on rights, reporting pathways, and verifiable case signals that can be escalated through a trusted network of stewards (Gadgilwar 2026). This addresses a critical systemic barrier: under current Bangladeshi law, citizens cannot file cases directly in environmental courts, and when cases are filed by the Department of Environment or environmental lawyers in the High Courts, tracking enforcement remains challenging.

The Southeast Asia (SEA) Network of National Ozone Officers (NOOs), operating under UNEP's OzonAction Compliance Assistance Programme, has demonstrated how technological integration can support dual compliance obligations. At the April 2025 Network Meeting in Penang, Malaysia, participants from ten countries discussed digitalization of licensing systems and reporting mechanisms alongside the adoption of low-GWP and energy-efficient alternatives to HCFCs and HFCs (Mosaddeq 2024). The meeting, supported by the Multilateral Fund, provided a platform for sharing best practices in preventing illegal trade and integrating relevant activities into HCFC phase-out and HFC phase-down under a holistic approach.

Oman's national capacity-building programme (October 2025), while outside the immediate South/Southeast Asian focus, illustrates transferable models for customs enforcement integration. Sixteen Customs officers received training in monitoring imports and exports of controlled substances, identifying ODS and HFCs, and applying inspection procedures to prevent illegal trade, while twenty-four engineers and trainers received hands-on training on leak detection, safe handling of flammable refrigerants, and recovery and recycling techniques (Klaly 2025). Such integrated customs-technician training models could be adapted across South and Southeast Asian jurisdictions to strengthen enforcement chains from border control to end-user compliance.

9.2. Institutional Reforms: Environmental Courts, Regional Frameworks, and Access to Justice

Institutional strengthening through specialized environmental courts and tribunals (ECTs) constitutes a second critical pathway. The recently published volume *Environmental Courts and Tribunals in Asia-Pacific: Best Practices, Challenges, and the Way Forward* (Brill/Nijhoff, 2025), edited by Linda Yanti Sulistiawati and Sroyon Mukherjee, provides comprehensive analysis of ECT features across multiple jurisdictions including Australia, China, India, Indonesia, Japan, New Zealand, Pakistan, the Philippines, and Sri Lanka (APCEL 2025b). The volume examines best practices from India's National Green Tribunal, the Philippines' environmental court system, Indonesia's judicial certification model, and Pakistan's climate jurisprudence, offering comparative insights for regional legal reform.

The World Justice Project (WJP), in collaboration with the Asian Development Bank (ADB) and Konrad Adenauer Stiftung (KAS), launched the Environmental Rule of Law Index (EROLI) in Manila on 28 April 2025. This landmark initiative aims to strengthen measurement and enforcement of environmental protection laws across the Asia-Pacific region. Drawing on insights from Latin America, the EROLI is envisioned as a policy tool to assess environmental rule of law performance, support governments in translating commitments into meaningful actions, and identify enforcement gaps through real-world case studies. Key institutions including the Asia-Pacific Centre for Environmental Law (APCEL) at the National University of Singapore, the World Resources Institute, and UNEP are contributing to methodology refinement for the Asia-Pacific context (APCEL and NUS 2025).

The December 2025 Regional Roundtable Dialogue in Bangkok, convened by the Raoul Wallenberg Institute of Human Rights and Humanitarian Law (RWI), brought together judicial actors, public interest lawyers, National Human Rights Institutions, civil society organizations, Indigenous Peoples' representatives, and Environmental Human Rights Defenders from across Southeast Asia. The dialogue focused on operationalizing the access to environmental justice (A2EJ) elements of the newly adopted ASEAN Declaration on the Right to a Safe, Clean, Healthy, and Sustainable Environment (ADER) (Albajili 2025). Participants identified persistent barriers including threats and reprisals against defenders, limited access to information, high litigation costs, heavy evidentiary burdens, and difficulties in addressing transboundary environmental harm, while also highlighting positive developments including growing recognition of environmental rights and the potential for a guidebook on Rules of Procedure on Environmental Cases (RPEC) to support rights-based judicial processes.

Key recommendations emerging from the dialogue included: developing clearer normative guidance under the Regional Plan of Action (RPA), including shared standards on meaningful participation, access to remedies, legal standing for affected communities, and procedural safeguards ensuring decisions are timely, affordable, transparent, and enforceable; strengthening collaboration between AICHR, NHRIs (including through SEANF), and judicial bodies such as the Council of ASEAN Chief Justices (CACJ); and establishing regional learning platforms, case repositories, and capacity-building initiatives with clear monitoring and follow-up mechanisms under the RPA (Albajili 2025). Together, these institutional pathways—ECT specialization, rule of law measurement, and regional procedural harmonization under ADER—offer a coherent framework for translating environmental rights into enforceable legal outcomes across South and Southeast Asia.

10. Conclusion and Policy Recommendations

This article has demonstrated that environmental governance across South and Southeast Asia suffers from a persistent ratification-implementation gap: high treaty accession rates coexist with weak domestic enforcement, regulatory capture, and institutional capacity deficits. Comparative analysis confirms that while Southeast Asia exhibits relatively higher prospects for environmental sustainability—attributable to stronger regional cooperation mechanisms under ASEAN and greater institutional experimentation with specialized adjudicatory bodies—both regions share fundamental barriers including corruption, understaffed pollution control boards, and the absence of binding dispute resolution mechanisms in regional agreements such as the AATHP (Lei et al. 2023a). The evidence from India's National Green Tribunal, Indonesia's judicial certification system, and the

Philippines' Writ of Kalikasan suggests that specialized environmental courts and procedural innovations can enhance compliance, yet their effectiveness remains contingent on judicial independence, technical expertise, and sustained political will(APCEL 2025b).

Accordingly, five policy recommendations emerge. **First**, SAARC and ASEAN should adopt binding dispute resolution protocols for transboundary pollution, moving beyond the AATHP's voluntary framework. **Second**, legislatures must amend environmental statutes to explicitly admit satellite remote sensing and AI-generated evidence, as demonstrated by the Karnataka High Court's 2026 illegal sand mining jurisprudence(Gadgilwar 2026). **Third**, specialized environmental courts or judicial certification systems should be established across both regions, drawing on best practices documented in Environmental Courts and Tribunals in Asia-Pacific (Brill/Nijhoff, 2025). **Fourth**, anti-corruption agencies must prioritize environmental crime prosecution; Indonesia's KPK currently prosecutes resource sector corruption in only 6% of cases despite such corruption producing three times the state losses of financial sector corruption(Haynie 2024b). **Fifth**, the Environmental Rule of Law Index (EROLI), launched in April 2025, should be adopted as a measurable compliance assessment tool across both regions(APCEL and NUS 2025). Without these interlocking reforms, environmental laws in South and Southeast Asia will remain unenforced paper commitments while ecosystems degrade and affected communities bear the cost.

Declaration

I declare that the manuscript is an original and previously unpublished work written by me. I would be solely responsible for any dispute arising out of my manuscript, including copyright, defamation, objectionable content, or contempt, and agree to suffer the loss, if any, caused by violating copyright or any other rights.

Reference

- Abubakar, Muhammad. 2025. "Climate of Corruption – Riphah Information Portal." <https://portal.riphah.edu.pk/newspaper/climate-of-corruption/> (April 21, 2026).
- Alam, Shawkat. 2024. "Cross-Fertilization of Environmental Law in the SAARC: Exploring Substantive and Constitutional Environmental Rights." In *The Oxford Handbook of Environmental and Natural Resources Law in India*, eds. Philippe Cullet, Lovleen Bhullar, and Sujith Koonan. Oxford, UK ; New York: Oxford University Press, 61–84. doi:10.1093/oxfordhb/9780198884682.013.3.
- Albajili, Charlie Meidino. 2025. "Regional Roundtable Dialogue on Operationalising Access to Environmental Justice under ADER." *The Raoul Wallenberg Institute of Human Rights and Humanitarian Law*. <https://rwi.lu.se/news/regional-roundtable-dialogue-on-operationalising-access-to-environmental-justice-under-ader/> (April 21, 2026).
- Alvin, Sia Dewei. 2022. "Effectiveness of the ASEAN Agreement on Transboundary Haze Pollution." *Environmental Law Review* 24: 305–13. doi:10.1177/14614529221126335.
- APCEL. 2025a. "APCEL Book Launch: Environmental Courts and Tribunals in Asia-Pacific." *Asia-Pacific Centre for Environmental Law*. <https://law.nus.edu.sg/apcel/media/apcel-book-launch-environmental-courts-and-tribunals-in-asia-pacific/> (April 21, 2026).
- APCEL. 2025b. "APCEL Book Launch: Environmental Courts and Tribunals in Asia-Pacific." *Asia-Pacific Centre for Environmental Law*. <https://law.nus.edu.sg/apcel/media/apcel-book-launch-environmental-courts-and-tribunals-in-asia-pacific/> (April 21, 2026).
- APCEL, and NUS. 2025. "New Index to Strengthen Environmental Governance in Asia-Pacific Unveiled." *Asia-Pacific Centre for Environmental Law*. <https://law.nus.edu.sg/apcel/media/new-index-to-strengthen-environmental-governance-in-asia-pacific-unveiled/> (April 21, 2026).
- Boer, Ben. 2016. "Environmental Law in Southeast Asia." In *Routledge Handbook of the Environment in Southeast Asia*, Routledge.
- Brunnée, Jutta, and Stephen J. Toope. 2010. *Legitimacy and Legality in International Law: An Interactional Account*. Cambridge: Cambridge University Press. doi:10.1017/CBO9780511781261.
- Caminos, Hugo, and Vincent P. Cogliati-Bantz, eds. 2014. "The Legal Regime of Straits: Contemporary Challenges and Solutions." In *The Legal Regime of Straits: Contemporary Challenges and Solutions*, Cambridge: Cambridge University Press, 1–8. doi:10.1017/CBO9780511777189.001.
- Case Digest: G.R. No. 223076 - Braga vs. Abaya*. 2016.
- Chandra, Dakshina, and Navajyoti Samanta. 2025. "Between Compliance and Commitment: Evaluating India's ESG Regulatory Framework." *Amicus Curiae* 6(3): 743–72. doi:10.14296/ac.v6i3.5795.

- Cullet, Philippe. 2015. "Principle 7 – Common but Differentiated Responsibilities." doi:10.1093/law/9780199686773.003.0011.
- Environment, U. N. 2011. *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes | UNEP - UN Environment Programme*. <https://www.unep.org/resources/report/basel-convention-control-transboundary-movements-hazardous-wastes> (April 20, 2026).
- Environment, U. N. 2026. "Strengthening Regional Cooperation on Ozone and Climate Action in Southeast Asia | Ozonaction." <https://www.unep.org/ozonaction/index.php/news/news/strengthening-regional-cooperation-ozone-and-climate-action-southeast-asia> (April 20, 2026).
- Feng, Zhaoyin. 2025. "Tracing 'Waste Colonialism' in Southeast Asia." *Global Voices*. <https://globalvoices.org/2025/09/01/tracing-waste-colonialism-in-southeast-asia/> (April 20, 2026).
- Gadgilwar, Atharva. 2026. "AI-Optimized Illegal Sand Mining: Satellite Remote Sensing Evidence Under MMDR Act Post-Karnataka HC 2026 Orders | International Journal of Law Management & Humanities." 09(02): 1331–41. doi:<https://doi.org/10.10000/IJLMH.1111631>.
- Ganegama, G. M. K. S. K. 2026a. "Greening The Bench: The Role of Public Interest Litigation in Fostering Environmental Consciousness: A Socio-Legal Inquiry in South Asia." *Proceedings of International Forestry and Environment Symposium* 30. doi:10.31357/fesympo.v30.8967.
- Ganegama, G. M. K. S. K. 2026b. "Greening The Bench: The Role of Public Interest Litigation in Fostering Environmental Consciousness: A Socio-Legal Inquiry in South Asia." *Proceedings of International Forestry and Environment Symposium* 30. doi:10.31357/fesympo.v30.8967.
- Ghosh, Sanjana. 2025. "Discretion and Capture: How Politics Shapes Pollution Enforcement in India." *World Bank Blogs*. <https://blogs.worldbank.org/en/impactevaluations/discretion-and-capture--how-politics-shapes-pollution-enforcemen> (April 21, 2026).
- Greene, David, and Hannah Simpson. 2023. "Is the Sun Shining on Shell? Environmental Activism vs. Corporate Responsibility." *Edwin Coe LLP*. <https://www.edwincoe.com/blogs/is-the-sun-shining-on-shell-environmental-activism-vs-corporate-responsibility/> (April 21, 2026).
- Haynie, Jack. 2024a. "Fiddling While the Rainforest Burns: The KPK, Indonesia's Natural Resources Sector, and Global Environmental Crisis." *GAB | The Global Anticorruption Blog*. <https://globalanticorruptionblog.com/2024/06/03/fiddling-while-the-rainforest-burns-the-kpk-indonesias-natural-resources-sector-and-global-environmental-crisis/> (April 21, 2026).
- Haynie, Jack. 2024b. "Fiddling While the Rainforest Burns: The KPK, Indonesia's Natural Resources Sector, and Global Environmental Crisis." *GAB | The Global Anticorruption Blog*.

- <https://globalanticorruptionblog.com/2024/06/03/fiddling-while-the-rainforest-burns-the-kpk-indonesias-natural-resources-sector-and-global-environmental-crisis/> (April 21, 2026).
- Hoang, Nguyen Huy. 2025. "International Law from Vietnamese Perspectives."
https://www.academia.edu/129693517/International_Law_from_Vietnamese_perspectives
(April 19, 2026).
- IICA. 2025. "Board Responsibility and Sustainability-Related Disclosure in Asia."
<https://www.independentdirectorsdatabank.in/newsletter/2025/12/1/1437> (April 21, 2026).
- ilrdigit. 2026a. "Reclassifying Contamination: The Basel Convention's Plastic Amendments and Indonesia's Response to Illegal Imports." *American University International Law Review*.
<https://auilr.org/2026/02/25/reclassifying-contamination-the-basel-conventions-plastic-amendments-and-indonesias-response-to-illegal-imports/> (April 20, 2026).
- ilrdigit. 2026b. "Reclassifying Contamination: The Basel Convention's Plastic Amendments and Indonesia's Response to Illegal Imports." *American University International Law Review*.
<https://auilr.org/2026/02/25/reclassifying-contamination-the-basel-conventions-plastic-amendments-and-indonesias-response-to-illegal-imports/> (April 20, 2026).
- IMO. 2020. "Committed to Protecting South-East Asian Seas."
<https://www.imo.org/en/mediacentre/pages/whatsnew-1351.aspx> (April 21, 2026).
- Khurshid, Nabila, Asma Jabeen, Usman Shakoor, Fozia Munir, and Nabila Akram. 2024. "Dynamic Impact of Shadow Economy and Corruption on Environmental Sustainability: What Role Renewable Energy Consumption Play in Case of South Asian Economies." *Journal of Asian Economics* 94: 101784. doi:10.1016/j.asieco.2024.101784.
- Kim, Dayoon, Advancing the right to a healthy environment in Southeast Asia: addressing implementation gaps and Opportunities, and Nella Canales. 2025a. "Advancing the Right to a Healthy Environment in Southeast Asia: Addressing Implementation Gaps and Opportunities." doi:10.51414/sei2025.015.
- Kim, Dayoon, Advancing the right to a healthy environment in Southeast Asia: addressing implementation gaps and Opportunities, and Nella Canales. 2025b. "Advancing the Right to a Healthy Environment in Southeast Asia: Addressing Implementation Gaps and Opportunities." doi:10.51414/sei2025.015.
- Klaly, Khaled. 2025. "Oman Strengthens National Capacity for Refrigerant Management and Montreal Protocol Compliance." <https://www.unep.org/ozonaction/news/news/oman-strengthens-national-capacity-refrigerant-management-and-montreal-protocol> (April 21, 2026).
- Koh, Harold Hongju, Abram Chayes, Antonia Handler Chayes, and Thomas M. Franck. 1997. "Why Do Nations Obey International Law?" *The Yale Law Journal* 106(8): 2599. doi:10.2307/797228.

- Kusniati, Retno, Helmi Helmi, Mohamad Rapik, Bunga Permatasari, and Peerapon Jaderojananont. 2024. "An ASEAN Transboundary Haze Court: Why Does It Matter and How Is It Possible?" *Journal of Indonesian Legal Studies* 9(2): 739–66. doi:10.15294/jils.v9i2.4488.
- Lei, Lei, Ilhan Ozturk, Muntasir Murshed, Sirojiddin Abrorov, Rafael Alvarado, and Haider Mahmood. 2023a. "Environmental Innovations, Energy Innovations, Governance, and Environmental Sustainability: Evidence from South and Southeast Asian Countries." *Resources Policy* 82(C). doi:10.1016/j.resourpol.2023.103556.
- Lei, Lei, Ilhan Ozturk, Muntasir Murshed, Sirojiddin Abrorov, Rafael Alvarado, and Haider Mahmood. 2023b. "Environmental Innovations, Energy Innovations, Governance, and Environmental Sustainability: Evidence from South and Southeast Asian Countries." *Resources Policy* 82(C). doi:10.1016/j.resourpol.2023.103556.
- Lin Yuxin. 2026. "RimbaWatch lawsuit may lead to green claims guidelines; energy, plantation, banking sectors affected." *星洲网 Sin Chew Daily Malaysia Latest News and Headlines*. <https://www.sinchew.com.my/news/20260123/finance/7212935> (April 21, 2026).
- Md. Muhtasim Faiaz and Preeti Kana Sikder. 2026. "Fragmentary Approach toward Maritime Tribunals | The Daily Star." <https://www.thedailystar.net/law-our-rights/news/fragmentary-approach-toward-maritime-tribunals-3956411> (April 19, 2026).
- Michael, Neilson. 2025. *Indonesia's Ban on Importing Plastic Waste Met With Cautious Optimism From Campaigners*. <https://thedi diplomat.com/2025/03/indonesias-ban-on-importing-plastic-waste-met-with-cautious-optimism-from-campaigners/> (April 20, 2026).
- Mosaddeq, Issam. 2024. "Evidence for Accountability: Remote Sensing to Prevent the Environment from Harms." *The Frontier Technologies Hub*. <https://www.frontiertechhub.org/pilot-portfolio/evidence-for-accountability> (April 21, 2026).
- Muhammad, Fikri. 2021. "Environmental Agreement under the Non-Interference Principle: The Case of ASEAN Agreement on Transboundary Haze Pollution." <https://hdl.handle.net/10419/287269> (April 21, 2026).
- Murulitharan, Jayaprakash. 2021. "Depoliticising Southeast Asia's Forest Fire Pollution | East Asia Forum." <https://eastasiaforum.org/2021/08/17/depoliticising-southeast-asias-forest-fire-pollution/> (April 21, 2026).
- Newspaper, The Peninsula. 2025. "NGOs Laud Tougher Malaysia Plastic Trash Import Laws." <https://thepeninsulaqatar.com/article/07/07/2025/ngos-laud-tougher-malaysia-plastic-trash-import-laws> (April 20, 2026).

- Nieves, Carlos. 2026. "Global Shipbreaking Report Highlights Safety Concerns and Environmental Impact | World Ports Organization." <https://www.worldports.org/global-shipbreaking-report-highlights-safety-concerns-and-environmental-impact/> (April 19, 2026).
- Programme, Asia & the Pacific. 2024. "Southeast Asian Region: Judicial Dialogue Considers How to Make Courts More Effective in Environmental Cases | ICJ." *International Commission of Jurists*. <https://www.icj.org/southeast-asian-region-judicial-dialogue-considers-how-to-make-courts-more-effective-in-environmental-cases/> (April 20, 2026).
- Puno, Reynato S., and Dante B. Gatmaytan. 2024. "Environmental Activism by the Philippine Supreme Court: Initiatives and Impediments." *Asia Pacific Journal of Environmental Law* 27(1): 10–35. doi:10.4337/apjel.2024.01.01.
- Rajamani, Lavanya, and Lavanya Rajamani. 2006. *Differential Treatment in International Environmental Law*. Oxford, New York: Oxford University Press.
- Razzaque, J. 2002. "Human Rights and the Environment -National Experiences-." *Environmental Policy and Law* 32(2): undefined-undefined.
- Reports of the Secretary-General on Oceans and the Law of the Sea*. 2025. The General Assembly. Reports of the Secretary-General. https://static.un.org/Depts/los/general_assembly/general_assembly_reports.htm (April 19, 2026).
- Riliananda, Primagung Dary. 2025. "Not Our Trash: Indonesia's Struggle with World's Plastic Waste." *FairPlanet*. <https://www.fairplanet.org/story/not-our-trash-indonesias-struggle-with-the-worlds-plastic-waste/> (April 20, 2026).
- Rizky, Fajar Khaify, Suhaidi Suhaidi, Alvi Syahrin, and Jelly Leviza. 2020. "State's Responsibility over Forest and Land Fires Causing Transboundary Haze Pollution in the Frame of ASEAN Agreement." *Jambe Law Journal* 3(1): 65–81. doi:10.22437/jlj.3.1.65-81.
- RWI. 2024. "Southeast Asian Judges Convene in Bangkok to Strengthen Environmental Justice and Regional Procedural Standards." *The Raoul Wallenberg Institute of Human Rights and Humanitarian Law*. <https://rwi.lu.se/southeast-asian-judges-convene-in-bangkok-to-strengthen-environmental-justice-and-regional-procedural-standards/> (April 21, 2026).
- Sands, Philippe, Jacqueline Peel, Adriana Fabra, and Ruth MacKenzie. 2018. *Principles of International Environmental Law*. Cambridge University Press.
- Sarin, Ritu. 2024. "Tax Crackdown Draws Links between NGOs — in 'Cause' and Funding Pattern." *The Indian Express*. <https://indianexpress.com/article/india/tax-crackdown-draws-links-between-ngos-in-cause-and-funding-pattern-9600786/> (April 21, 2026).

- SEAFDEC. 2025. "BOBLME - MCS Workshop." *Information Exchange on Monitoring Control and Surveillance of Combating IUU Fishing*. <https://www.seafdec.or.th/mcs/boblme/workshop-2025/timetable.html> (April 19, 2026).
- Shah, Manasi. 2025. "Delhi Pollution Crisis | We Have Mechanisms but No Will to Address Issues, Says Supreme Court." *Supreme Court Observer*. <https://www.scobserver.in/journal/delhi-pollution-crisis-we-have-mechanisms-but-no-will-to-address-issues-says-supreme-court/> (April 21, 2026).
- Sharma, Pratibha. 2026a. "Nature vs. Necessity: Decoding the Vanashakti Balancing Test." *Law and Other Things*. <https://lawandotherthings.com/nature-vs-necessity-decoding-the-vanashakti-balancing-test/> (April 19, 2026).
- Sharma, Pratibha. 2026b. "Nature vs. Necessity: Decoding the Vanashakti Balancing Test." *Law and Other Things*. <https://lawandotherthings.com/nature-vs-necessity-decoding-the-vanashakti-balancing-test/> (April 19, 2026).
- Stone, Christopher D. 2004. "Common But Differentiated Responsibilities in International Law." *American Journal of International Law* 98(2): 276–301. doi:10.2307/3176729.
- Tandon, Aditi. 2024. "Crackdown on Civil Society and Environmental NGOs Continues." *Mongabay-India*. <https://india.mongabay.com/2024/07/crackdown-on-civil-society-and-environmental-ngos-continues/> (April 21, 2026).
- Tang, Yaru, Mengdi Liu, Fan Xia, and Bing Zhang. 2024. "Informal Regulation by Nongovernmental Organizations Enhances Corporate Compliance: Evidence from a Nationwide Randomized Controlled Trial in China." *Journal of Policy Analysis and Management* 43(1): 234–57. doi:10.1002/pam.22530.
- The Ministry of the Environment (MOE). 2025. "Outcome of the Asian Network Workshop for Prevention of Illegal Transboundary Movement of Hazardous Wastes." https://www.env.go.jp/en/press/press_024690.html (April 20, 2026).
- UNEP. 2021. *En.Ozone.Org.Cn/Wn/202103/T20210329_826517.Html*. http://en.ozone.org.cn/wn/202103/t20210329_826517.html (April 20, 2026).
- V. Srinivasan v Union of India and Others*. 2012. (National Green Tribunal).
- Wanadi, M. Adil, Femmy Sofie Schouten, Wisnu Handoko, William Seno, Yus Rizal, and Guntur Tri Indra. 2025. "The Role of MARPOL Annex V Implementation in Reducing Marine Litter in Indonesia: Challenges and Opportunities." *Meteor STIP Marunda* 18(1): 23–26. doi:10.36101/msm.v18i1.414.
- Wijayanti, Amelia. 2025. "WFD's Environmental Democracy Observatory Charts a Path for Inclusive Environmental Governance." <https://www.wfd.org/commentary/wfds-environmental-democracy-observatory-charts-path-inclusive-environmental-governance> (April 21, 2026).

WTO. 2024. "QR Thailand #10623 - WTO Quantitative Restrictions." <https://qr.wto.org/en/qrs/10623> (April 20, 2026).

Yong, Wang, and Pan Xin. 2024. "The Application of the Principle of Common but Differentiated Responsibilities in Environmental Governance on the High Seas." *Chinese Journal of International Law* 23(1): 151–84. doi:10.1093/chinesejil/jmae015.

Zhang, Hanrui, and Jia Wan. 2025. "The 'Blue Community' of the Indian Ocean: Cooperation, Challenges and Prospects for Marine Environmental Protection among South Asian Countries." *Frontiers in Marine Science* 12. doi:10.3389/fmars.2025.1683236.