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Transnational Environmental Crime in the Context of International Criminal Law and Victim-Centered Environmental Justice

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Abstract

Transnational environmental crimes are among the most complex and destructive forms of cross-border criminality, including wildlife trafficking, illegal trade of endangered species, transboundary pollution, and unlawful exploitation of natural resources by state and non-state actors. These offenses have yet to gain explicit recognition as core international crimes, despite their severe impacts on ecosystems, geopolitical stability, and local communities. This article examines the urgent need to incorporate transnational environmental crimes into international criminal law and emphasizes a victim-centered environmental justice approach to restore the rights and sustainability of affected communities. Using normative and comparative legal analysis, it advocates recognizing ecocide and cross-border environmental offenses as serious violations of ecological justice and human rights. The study further explores how victim protection frameworks can extend to Indigenous communities, future generations, and non-human entities, offering guidance for Indonesia in building a more responsive, transnational, and victim-oriented environmental criminal justice system.

A. Introduction

Transnational environmental crime has become one of the most complex and destructive forms of criminal activity in the globalized era. Extending beyond national borders, it involves sophisticated networks of actors operating across multiple jurisdictions.[1] These crimes constitute

[1] Meredith L. Gore et al., "Transnational Environmental Crime Threatens Sustainable Development," *Nature Sustainability* 2, no. 9 (September 1, 2019): 784–86, https://doi.org/10.1038/S41893-019-0363-6;SUBJMETA=648,689,706;KWRD=SCIENTIFIC+COMMUNITY,SOCIAL+SCIENCES.

serious threats to global ecological stability, the sustainability of natural resources, and the rights of local and Indigenous communities.

Manifestations of transnational environmental crime include illegal wildlife trade, illicit logging, unauthorized mining, hazardous waste trafficking, and the exploitation of protected areas. Their complexity arises not only from their transboundary nature but also from the involvement of powerful actors such as multinational corporations, organized environmental crime groups, and corrupt officials.[2]

With increasing scale and impact, environmental crime now ranks among the world's most profitable illicit sectors, comparable to drug, human, and arms trafficking. A 2022 Interpol–UNEP report estimates its global economic value between USD 110–281 billion annually, marking it as the fastest-growing transnational crime, expanding by 5–7% per year—well above the rate of global economic growth.[3] This rapid escalation underscores a widening gap between the magnitude of environmental crimes and the effectiveness of existing legal and enforcement mechanisms. For example, illegal logging in the Amazon and Southeast Asia destroys millions of hectares of tropical rainforest annually, causing severe biodiversity loss, climate disruption, and the displacement of Indigenous populations.[4]

The transnational dimension of environmental crimes presents significant legal challenges. Perpetrators often operate beyond the reach of domestic jurisdictions because their activities span multiple states or because the state of origin lacks the legal or institutional capacity to prosecute offenses committed abroad. At the international level, the Rome Statute of the International Criminal Court (ICC) does not explicitly include environmental crimes among its four core categories: genocide, crimes against humanity, war crimes, and the crime of aggression.[5] However, the ecological destruction caused by these crimes often rivals or exceeds the long-term and systemic impacts of these established offenses.

This absence of legal recognition has created a normative gap in international accountability, allowing serious environmental harm to persist without adequate sanction. In response, a growing international movement has called for the formal recognition of ecocide as the fifth core international crime.[6]

The term "ecocide," first introduced by legal scholar Richard Falk in 1973, has reemerged in global legal discourse through the advocacy of civil society organizations such as the Stop Ecocide Foundation. Pacific island nations, including Vanuatu, Samoa, and the Maldives, have formally proposed the inclusion of ecocide in the Rome Statute.[7] The proposed definition characterizes ecocide as "unlawful or wanton acts committed with knowledge that there is a substantial likelihood of severe and either widespread or long-term damage to the environment." Although debate continues over the legal thresholds of "severe," "widespread," and "long-term," international momentum is steadily increasing.[8] In 2024, the European Union and Belgium incorporated ecocide-like provisions into the EU Environmental Crime Directive, requiring member states to transpose these norms into national legislation by 2026.[9]

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[2] Linert Lirëza and Gentian Koçi, "Environmental Crimes: Their Nature, Scope, and Problems in Identification," *Interdisciplinary Journal of Research and Development* 10, no. 1 S1 (May 20, 2023): 237–237, https://doi.org/10.56345/IJRDV10N1S135.

[3] Bonnie Rippingille, "Editorial: Beyond All Boundaries the Meteoric Rise of Environmental Crime," *Journal of Financial Crime* 30, no. 5 (November 30, 2023): 1113–16, https://doi.org/10.1108/JFC-10-2023-311/FULL/PDF.

[4] Eduardo Frederico Cabral de Oliveira, José Francisco de Oliveira Júnior, and José Augusto Ferreira da Silva, "Legal Amazon, Sustainable Use and Environmental Surveillance 'Systems': Historical Legacy and Future Prospects," *Revista Brasileira de Ciências Ambientais* 56, no. 1 (February 4, 2021): 49–64, https://doi.org/10.5327/Z2176-947820200680.

[5] Caroline V. Comerford, "Rome Statute of the International Criminal Court," *The Encyclopedia of Women and Crime*, August 23, 2019, 1–4, https://doi.org/10.1002/9781118929803.EWAC0441.

[6] Louis J. Kotzé, "International Environmental Law's Lack of Normative Ambition: An Opportunity for the Global Pact for the Environment?," *Journal for European Environmental & Planning Law* 16, no. 3 (September 11, 2019): 213–36, https://doi.org/10.1163/18760104-01603002.

[7] Richard A. Falk, "Environmental Warfare and Ecocide — Facts, Appraisal, and Proposals," *Bulletin of Peace Proposals* 4, no. 1 (March 1973): 80–96, https://doi.org/10.1177/096701067300400105.

[8] Yicun Zhang, "International Criminal Law: Should Ecocide Become the Fifth Core International Crime?," *Studies in Law and Justice* 4, no. 2 (April 11, 2025): 50–59, https://doi.org/10.56397/SLJ.2025.04.06.

[9] Michael G. Faure, "The EU Environmental Crime Directive 2024: A Revolution in EU Environmental Criminal Law?," *Journal of Environmental Law* 36, no. 3 (November 11, 2024): 323–42, https://doi.org/10.1093/JEL/EQAE020.

Table. 1 Examples of Transnational Environmental Crime and Real Cases

Type of Transnational Environmental Crime	Real Case Example	Countries Involved	Year/Period
Illegal Wildlife Trade	Anson Wong case involving trafficking of endangered species	Malaysia, Southeast Asia	2010
Illegal Toxic Waste Dumping	Probo Koala toxic waste dumping scandal	Netherlands, Ivory Coast	2006
Illegal Logging Across Borders	Amazon rainforest illegal logging networks	Brazil, Peru, Bolivia	Ongoing
Illegal Marine Products Trade	Shark fin trafficking from Indonesia to Hong Kong	Indonesia, Hong Kong	2015–Present
Sand Smuggling	Sand export from Riau Islands to Singapore causing island erosion	Indonesia, Singapore	1990s–2010s

Source: Processed from various sources

Table 1 presents illustrative cases of transnational environmental crimes that reveal their global scale and complexity. Each example demonstrates how environmental harm transcends borders and exploits legal and enforcement gaps. The Anson Wong case exemplifies the sophistication of the illegal wildlife trade in Southeast Asia and the weaknesses of CITES enforcement.[10] The Probo Koala incident shows how hazardous waste disposal is outsourced from developed to developing countries, as in the 2006 toxic dumping in Côte d'Ivoire.[11] Illegal logging in the Amazon highlights the persistent challenge of protecting vital ecosystems under weak cross-border monitoring.[12] Similarly, the shark fin trade from Indonesia to Hong Kong and historical sand smuggling from Indonesia's Riau Islands to Singapore illustrate the commodification of natural resources through transnational criminal networks. Collectively, these cases underscore the need for a harmonized international legal framework to combat transnational environmental crime.[13]

Transnational environmental crimes also produce severe social impacts, particularly on vulnerable communities. Indigenous peoples, small-scale fishers, subsistence farmers, and rural populations often suffer the earliest and greatest consequences of environmental degradation while lacking access to justice or political representation.[14] The loss of Indigenous lands through illegal logging, water contamination from industrial waste, and declining air quality from forest fires exemplify how environmental crimes violate basic human rights. In Indonesia, illegal sand exports from Riau to Singapore have caused the disappearance of small islands and disrupted coastal

[10] Gail Emilia Rosen and Katherine F. Smith, "Summarizing the Evidence on the International Trade in Illegal Wildlife," *EcoHealth* 7, no. 1 (August 4, 2010): 24–32, https://doi.org/10.1007/S10393-010-0317-Y/METRICS.

[11] Sara Dezalay and Simon Archer, "By-Passing Sovereignty: Trafigura Lawsuits (Re Ivory Coast)," in *Global Private International Law: Adjudication without Frontiers* (Edward Elgar Publishing Ltd., 2019), 92–116, https://doi.org/10.4337/9781788119238.00014.

[12] Anne Cristina de la Vega-Leinert and Christoph and Huber, "The Down Side of Cross-Border Integration: The Case of Deforestation in the Brazilian Mato Grosso and Bolivian Santa Cruz Lowlands," *Environment: Science and Policy for Sustainable Development* 61, no. 2 (March 4, 2019): 31–44, https://doi.org/10.1080/00139157.2019.1564214.

[13] Isabel Devitt, "Greenwashing in the Meat and Seafood Industry," *University of South Australia Law Review* 6 (August 30, 2024): 21–21, https://doi.org/10.21913/USLRUNISALR.V6.1689.

[14] Virginia Comolli and Alastair Macbeath, "Special Section Introduction: Exploring the Nexus between Human Vulnerabilities and Environmental Crime," *Journal of Illicit Economies and Development* 4, no. 1 (2022): 1–7, https://doi.org/10.31389/JIED.154.

livelihoods.[15] These cases affirm that environmental crime is not only an ecological issue but also a matter of social justice and human rights.

Within this context, there is an urgent need to establish legal frameworks that are not only retributive but also responsive to the rights and needs of victims. A victim-centered approach to environmental justice has gained increasing recognition as a more inclusive and restorative model of legal response. This approach moves beyond the traditional focus on punishing perpetrators and emphasizes the restoration of victims' rights, ecological rehabilitation, and equitable compensation for affected communities. By shifting from an anthropocentric and punitive perspective to one that incorporates ecocentric and restorative principles, the legal system can better address the multidimensional harms of environmental crime. This reorientation is particularly relevant where environmental degradation affects entire ecosystems and future generations.

Despite its promise, implementing a victim-centered approach remains a major challenge at both international and national levels. Internationally, no specific mechanism currently provides compensation or reparations for victims of transnational environmental crimes. Domestically, many legal systems still fail to recognize affected communities or non-human entities as legal subjects entitled to protection or redress. Yet the effectiveness of environmental law enforcement depends on frameworks that empower victims, uphold their rights, and integrate ecological restoration into legal remedies.[16] Some countries, including Ecuador, Bolivia, and New Zealand, have pioneered legal innovations by recognizing the rights of nature in their constitutions, offering a new legal and philosophical foundation for environmental protection and victim redress.

Indonesia, as a megadiverse country facing escalating environmental threats, could benefit from engaging with these global developments. Although Law No. 32 of 2009 on Environmental Protection and Management provides a basis for addressing environmental violations, it remains limited in scope and does not adequately encompass transnational dimensions of environmental crime.[17] Moreover, Indonesia's criminal code lacks provisions for ecocide or other cross-border environmental offenses. This legal gap constrains law enforcement and judicial capacity to hold transnational actors accountable and to secure justice for victims. Reforming Indonesian criminal law to include ecocide and recognize the rights of environmental victims would align domestic legislation with emerging global norms and strengthen the pursuit of environmental justice.

Addressing the multifaceted nature of transnational environmental crime requires comprehensive reform of conceptual, normative, and institutional frameworks. The international community must work toward building consensus on recognizing ecocide as a core international crime, while national governments should strengthen domestic legislation by incorporating victim-centered mechanisms and ecocentric principles. Such legal innovation is not aspirational but essential in the face of escalating global environmental crises. Adopting a progressive and system-wide approach to environmental criminal law that is both punitive and restorative would enable states to confront deliberate and organized ecological destruction, one of the defining challenges of the twenty-first century.

This study employs a normative legal method that combines statutory, conceptual, and comparative approaches to examine transnational environmental crime and victim-centered justice. Legal materials include statutes, jurisprudence, and international instruments, which are analyzed qualitatively.[18]

Transnational environmental crimes have increased in frequency and complexity, encompassing activities such as illegal wildlife trade, illicit logging, hazardous waste dumping, and cross-border exploitation of natural resources. Interpol and the United Nations Environment Programme (UNEP)

[15] Andhika P. Prasetyo et al., "Disentangling the Shark and Ray Trade in Indonesia to Reconcile Conservation with Food Security," *BioRxiv*, December 10, 2020, 2020.12.08.416214, https://doi.org/10.1101/2020.12.08.416214.

[16] Alvaro Augusto Sanabria-Rangel, "The Environment as a Victim: Overcoming the Human-Centric Paradigm of Rights," *Revista de La Facultad de Derecho de México* 74, no. 290 (December 13, 2024): 5–36, https://doi.org/10.22201/FDER.24488933E.2024.290.89299.

[17] Mayer Hayrani DS, "Perkembangan Hukum Pidana Lingkungan Hidup," *Jurnal Legislasi Indonesia* 15, no. 4 (2018): 333, http://www.mongabay.

[18] Pidari Sinaga et al., "Kejahatan Biodiversitas Dan Urgensi Peran Hukum Pidana Dalam Sektor Agraria," *Jurnal Pembangunan Hukum Indonesia* 6, no. 2 (June 27, 2024): 210–42, https://doi.org/10.14710/JPHI.V6I2.210-242.

estimate that these crimes generate hundreds of billions of US dollars annually, ranking among the most profitable forms of transnational crime after drug and human trafficking.[19] Despite their magnitude, most existing studies address environmental crime from administrative or policy-oriented perspectives, without fully engaging with substantive criminal law or victim-centered justice. International instruments such as the Basel Convention and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) provide important regulatory frameworks but lack strong criminal enforcement mechanisms. Research in this area also remains fragmented, offering limited conceptual and normative analysis of cross-border legal challenges, particularly those involving corporate actors, jurisdictional limits, and victim protection.[20]

A key gap in the literature is the lack of systematic integration of victim-centered approaches into environmental criminal justice systems. Normative deficiencies within domestic laws further hinder the prosecution of transnational environmental crimes. In Indonesia, for example, environmental law still relies largely on administrative sanctions, while the criminal dimension, especially concerning transnational corporations and organized networks—remains weak both structurally and institutionally.

This study seeks to fill these gaps by offering normative recommendations for reforming Indonesia's criminal law. It proposes the formulation of new environmental offenses and the expansion of victim protection mechanisms within the Criminal Code and related legislation. The study also emphasizes the importance of embedding victim protection principles into environmental criminal law. Because victims of transnational environmental crimes are often collective and diffuse, traditional offender-focused approaches are inadequate. A restorative framework that integrates ecological rehabilitation with social redress is therefore essential to achieving substantive environmental justice.

B. Discussion

1. Reconstructing the Legal Framework for Transnational Environmental Crime through Normative and Comparative Analysis

Transnational environmental crime presents a significant legal challenge for countries whose legal systems remain bound by territorial logic and domestic enforcement paradigms.[21] In Indonesia, this limitation is evident in the current environmental legislation. Although Law No. 32 of 2009 on Environmental Protection and Management criminalizes certain environmentally harmful acts, it lacks a clear framework for addressing offenses with cross-border implications. Activities such as the unauthorized export of natural resources or the importation of hazardous waste are typically treated as administrative or customs violations rather than substantive environmental crimes.

This reliance on regulatory and licensing-based enforcement prioritizes compliance over ecological harm and criminal accountability. While adequate for domestic offenses, it is ineffective against the increasingly globalized nature of environmental degradation. The absence of explicit provisions addressing transboundary crimes leaves legal institutions ill-equipped to pursue offenders operating across jurisdictions, particularly those exploiting multi-jurisdictional supply chains or shifting environmental harm abroad.[22]

Indonesia's Criminal Code (KUHP), inherited from Dutch colonial law, compounds this weakness.[23] The code remains focused on traditional offenses such as personal injury, property

[19] Bonnie Rippingille, "Editorial: Beyond All Boundaries the Meteoric Rise of Environmental Crime," *Journal of Financial Crime* 30, no. 5 (November 30, 2023): 1113–16, https://doi.org/10.1108/JFC-10-2023-311/FULL/PDF.

[20] Philippe Sands, "International Management of Hazardous Wastes: The Basel Convention and Related Legal Rules.," *American Journal of International Law* 91, no. 3 (July 1997): 572–73, https://doi.org/10.2307/2954200.

[21] Grazia Maria Vagliasindi, "Legal Perspectives on Environmental Crime: The Transnational Dimension of Environmental Crime," *Research Handbook on Transnational Crime*, December 19, 2019, 142–161, https://doi.org/10.4337/9781784719449.00017.

[22] Simon Butt and Tim Lindsey, "The Criminal Code," in *Crime and Punishment in Indonesia* (Routledge, 2020), 21–43, https://doi.org/10.4324/9780429455247-3.

[23] Angus Nurse, "Green Criminology: Shining a Critical Lens on Environmental Harm Comment," *Palgrave Communications* 3, no. 1 (December 1, 2017): 1–4, https://doi.org/10.1057/S41599-017-0007-2;SUBJMETA=2808,4002,4014;KWRD=CRIMINOLOGY,GEOGRAPHY.

crimes, and public disorder, leaving diffuse environmental harms such as marine pollution or biodiversity loss outside its scope. Consequently, no unified legal doctrine treats environmental damage as a distinct or transnational form of criminality. The code's anthropocentric orientation prioritizes harm to individuals and property, overlooking collective victims and ecological interests. This doctrinal gap is further reinforced by the weak integration between environmental and general criminal law.

The absence of a comprehensive framework for addressing transnational environmental crime is not unique to Indonesia. Germany, despite its advanced and multi-layered environmental legal system, also faces limitations in criminal enforcement when environmental harm extends beyond national borders. Provisions such as §326 of the German Criminal Code (Strafgesetzbuch, StGB) on the unlawful handling of waste and §324 on water pollution illustrate Germany's commitment to environmental protection. However, these provisions remain sectoral, addressing isolated ecological components such as air, soil, or water rather than the interconnected nature of transboundary environmental harm.[24]

This fragmented approach often confines enforcement to localized impacts, even when pollution or waste flows across jurisdictions. For example, in cases where hazardous substances are transported illegally from Poland into Germany and released into a river flowing downstream to other countries, responses typically rely on administrative measures such as remediation orders or regulatory fines rather than criminal prosecution. Criminal proceedings are rarely initiated unless intentional or clearly negligent conduct can be proven.

As in many civil law systems, German criminal law imposes stringent evidentiary requirements for establishing liability. Prosecutors must demonstrate intent or conscious negligence and establish a direct causal link between the offender's conduct and the resulting environmental damage.

In the Netherlands, the Urgenda Foundation v. State of the Netherlands case reflects a significant judicial step in holding governments accountable for environmental harm, affirming the state's duty to mitigate climate change under constitutional and human rights obligations.[25] Despite such progress in civil and administrative law, the Dutch criminal framework remains limited in addressing cross-border environmental harm.

The Penal Code lacks a specific category for transnational environmental crimes and mainly covers domestic offenses such as unlawful discharges, destruction of protected ecosystems, or permit violations. As a result, Dutch authorities cannot effectively prosecute offenses committed abroad by Dutch individuals or corporations unless these acts also violate foreign law and are pursued through international cooperation. This limitation is evident in cases where Dutch companies export electronic waste or toxic materials to developing countries. Although these activities cause severe environmental damage, they often escape criminal liability due to the absence of extraterritorial jurisdiction in Dutch criminal law.

In the international legal framework, instruments such as the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) are central to regulating cross-border environmental activities.[26]These treaties aim to curb the illicit trade in hazardous waste and endangered species, providing global norms to prevent environmental harm from spreading across borders.[27]

Despite broad ratification and ambitious goals, both conventions rely primarily on administrative enforcement rather than integrated criminal law mechanisms. The Basel Convention defines

[24] Aa Muhamad Zaenudin, Kristiawanto Kristiawanto, and Maryano Maryano, "Criminal Law Enforcement Against Perpetrators of Environmental Pollution in The Criminal Justice System in Indonesia," *POLICY, LAW, NOTARY AND REGULATORY ISSUES* 4, no. 2 (March 22, 2025): 191–210, https://doi.org/10.55047/POLRI.V4I2.1675.

[25] Josephine Van Zeben, "Establishing a Governmental Duty of Care for Climate Change Mitigation: Will Urgenda Turn the Tide?," *Transnational Environmental Law* 4, no. 2 (March 24, 2015): 339–57, https://doi.org/10.1017/S2047102515000199.

[26] Jennifer Clapp, "Seeping Through the Regulatory Cracks," *SAIS Review* 22, no. 1 (March 2002): 141–55, https://doi.org/10.1353/SAIS.2002.0004.

[27] Katharina Kummer, "The International Regulation of Transboundary Traffic in Hazardous Wastes: The 1989 Basel Convention," *International & Comparative Law Quarterly* 41, no. 3 (1992): 530–62, https://doi.org/10.1093/ICLQAJ/41.3.530.

unauthorized transboundary movements of hazardous waste as violations of international law but delegates enforcement to domestic legal systems.[28] Serious breaches, such as the export of toxic waste to developing countries without consent rarely lead to international criminal prosecution and are instead handled through administrative measures like shipment seizure or fines.

CITES faces similar limitations. Although it regulates trade in endangered species, it depends on national implementation and lacks a supranational body for criminal enforcement. Penalties vary across jurisdictions, creating uneven enforcement and legal loopholes that allow traffickers to exploit weak regulatory systems or use falsified documentation to evade controls.

The European Union's 2008 Environmental Crime Directive (Directive 2008/99/EC) marked a shift from administrative to criminal enforcement by requiring Member States to penalize serious ecological harms such as illegal emissions, waste dumping, and wildlife trafficking. Its 2024 revision broadened this mandate to include transboundary crimes like cross-border pollution, hazardous substance transport, and marine contamination while strengthening corporate liability and investigative obligations. Despite these advances, enforcement remains inconsistent. In Germany, federal fragmentation leads to uneven definitions and prosecutions of serious environmental crimes, especially for diffuse pollution. The Netherlands, though more adaptive, faces jurisdictional limits when Dutch actors cause harm beyond EU borders, highlighting the directive's weak extraterritorial scope. Because it provides minimum harmonization rather than full unification, differences in definitions, penalties, and procedures persist, hindering cross-border investigations and extradition. The EU's experience illustrates both the potential and limits of regional harmonization: while it promotes convergence in environmental accountability, sovereignty constraints and institutional disparities continue to undermine consistent enforcement—a cautionary example for ASEAN and other regional systems.[29]

A key doctrinal challenge in prosecuting transnational environmental crime lies in proving intent and foreseeability. Prosecutors must demonstrate that offenders knew or should have known their actions would cause cross-border harm, a burden that often results in dismissal of cases involving sand mining, wildlife trafficking, or hazardous waste exports due to jurisdictional or causation gaps. This weakens deterrence and dilutes criminal responsibility. International coordination through EU joint investigative teams and mutual legal assistance frameworks has improved cooperation but remains slow and uneven. Notably, Germany's Environmental Crimes Act and recent Dutch Criminal Code amendments now recognize corporate criminal liability for environmental offenses. In contrast, Indonesia's focus on individual liability leaves corporations largely shielded, facing only administrative sanctions. Incorporating explicit corporate environmental liability into Indonesia's criminal framework is essential to enhance deterrence, ensure accountability, and address transnational ecological harm effectively.

2. Victim-Centered Environmental Justice Toward Inclusive Protection in Environmental Criminal Law

Victim-centered environmental justice reframes environmental crime by positioning affected groups, including Indigenous peoples, coastal communities, and future generations as central actors in the justice system.[30] It challenges legal frameworks that define environmental harm mainly as a regulatory or property issue, urging recognition of human and ecological rights.[31] This approach broadens the concept of victimhood to include collective entities and non-human actors harmed by

[28] Nicholus Kilonzo, Joel T. Heinen, and Patrick Byakagaba, "An Assessment of the Implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora in Kenya," *Diversity* 16, no. 3 (March 18, 2024): 1–13, https://doi.org/10.3390/D16030183.

[29] Ricardo Pereira, "Towards Effective Implementation of the EU Environmental Crime Directive? The Case of Illegal Waste Management and Trafficking Offences," *Review of European, Comparative & International Environmental Law* 26, no. 2 (July 1, 2017): 147–62, https://doi.org/10.1111/REEL.12207.

[30] Rob White, "Environmental Victimology and Ecological Justice," in *Crime, Victims and Policy* (Palgrave Macmillan, London, 2015), 33–52, https://doi.org/10.1057/9781137383938_3.

[31] Dadek Nandemar and Amiruddin Amiruddin, "Corporate Social Responsibilty (CSR) Berkeadilan Sosial," *Accounting Profession Journal (APAJI)* 2, no. 2 (July 31, 2020): 56–71, https://doi.org/10.35593/APAJI.V2I2.11.

transboundary ecological degradation. Indigenous communities often bear the costs of resource extraction and deforestation by corporations that ignore ancestral land rights, resulting in the loss of sacred sites, livelihoods, and cultural identity. Yet existing laws typically recognize only tangible property damage, excluding cultural and spiritual harm. Victim-centered justice requires legal mechanisms that allow Indigenous groups to claim cultural loss, seek redress, and participate in decisions affecting their territories, reframing justice as collective and ecological rather than individual.

Coastal fishing communities affected by sand smuggling, marine pollution, and illegal dumping are often marginalized. Beach erosion, declining fisheries, and water contamination threaten their livelihoods and communal life. Prosecutions typically impose minimal penalties without requiring rehabilitation or community restitution. A victim-centered model would obligate offenders to undertake environmental remediation, restoring coastlines, replenishing fish stocks, and supporting local economic recovery. while ensuring community participation in sentencing and enforcement.[32]

Generational justice extends the normative foundation of victim-centered environmental law by recognizing that ecological harm transcends the present. Environmental crimes such as chemical contamination, deforestation, species loss, and greenhouse gas emissions produce long-term, often irreversible effects. Yet most legal systems lack mechanisms to protect the rights of future generations, who remain excluded from current legal and political processes. Victim-centered justice addresses this gap through legal stewardship and intergenerational trusteeship, establishing present-day representatives; guardians, ombudspersons, or public trustees to advocate for unborn or future victims in judicial and legislative forums.

These representatives promote ecological preservation, review policy sustainability, and intervene in cases involving projected harm. New Zealand's recognition of the Whanganui River as a legal person exemplifies this approach. The law, developed with the Māori[33], grants the river inherent rights and appoints guardians to safeguard its ecological and cultural integrity.[34] Though rooted in Indigenous cosmology, the model demonstrates how non-human and future-centric interests can gain legal standing within human-centered systems. Extending such frameworks to criminal law could transform the prosecution of long-term environmental offenses.[35] Legal reforms may require the appointment of future generation representatives in cases involving deforestation, fossil fuel extraction, or marine degradation, granting them standing to present evidence of projected harm, challenge inadequate settlements, and seek long-term remediation.[36] This would embed intergenerational accountability within criminal procedure and sentencing, supported by evidentiary standards that incorporate scientific projections and ecological forecasting.

Operationalizing victim-centered environmental justice requires structural reform within national criminal justice systems, particularly in procedural aspects of environmental litigation. Embedding these principles into criminal law entails establishing enforceable rights for affected communities and ecosystems to participate meaningfully in legal processes. Victims must be recognized not as passive observers but as active stakeholders with legitimate procedural standing.

A key reform involves guaranteeing victims timely notification of environmental crime investigations and prosecutions. Effective communication enables communities to prepare legal responses and document harms that might otherwise be excluded from evidence. Notification procedures must be inclusive, reaching marginalized and Indigenous groups through culturally appropriate means.

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[32] Matthew Hall, "Environmental Justice and Victimology," in *The Routledge Companion to Criminological Theory and Concepts* (Taylor and Francis, 2017), 276–79, https://doi.org/10.4324/9781315744902-62/ENVIRONMENTAL-JUSTICE-VICTIMOLOGY-MATTHEW-HALL.

[33] Christopher Finlayson, "A River Is Born: New Zealand Confers Legal Personhood on the Whanganui River to Protect It and Its Native People," *Sustainability and the Rights of Nature in Practice*, September 30, 2019, 259–78, https://doi.org/10.1201/9780429505959-13.

[34] Christopher Rodgers, "A New Approach to Protecting Ecosystems: The Te Awa Tupua (Whanganui River Claims Settlement) Act 2017," *Environmental Law Review* 19, no. 4 (December 1, 2017): 266–79, https://doi.org/10.1177/1461452917744909.

[35] Aikaterini Argyrou and Harry Hummels, "Legal Personality and Economic Livelihood of the Whanganui River: A Call for Community Entrepreneurship," *Water International* 44, no. 6–7 (October 3, 2019): 752, https://doi.org/10.1080/02508060.2019.1643525.

[36] Josiah David F. Quising, "Beyond OPOSA: Courts Reinforcing Intergenerational Equity as Customary International Law," *European Law Journal* 29, no. 3–6 (May 1, 2023): 422–44, https://doi.org/10.1111/EULJ.12489.

Victims should also have procedural access to evidence and hearings, especially when scientific data determine liability or environmental impact.[37] Allowing communities to submit ecological and social impact statements ensures that cultural loss and intergenerational harm inform judicial understanding and sentencing. These rights must be codified rather than left to prosecutorial discretion to ensure consistent participation.[38]

In addition, victims should be included in plea bargaining and restorative mediation, particularly in cases involving corporate offenders. Community participation can prevent settlements that minimize ecological harm and enable outcomes aligned with local priorities, such as rehabilitation projects, compensation funds, and long-term environmental monitoring. Jurisdictions like Ecuador, where courts recognize Indigenous communities and river ecosystems as legal parties, demonstrate how collective victimhood can be procedurally enforced to advance ecological justice.

Codifying these participatory rights within criminal procedure, supported by regulations and judicial training, is essential for institutional consistency. Such reforms would transform criminal law from a mechanism of retribution into a forum for restorative and ecological justice, where affected communities actively shape accountability and remediation.

Advancing environmental justice requires transforming sentencing practices in criminal law, particularly for offenses causing ecological harm. Conventional sanctions such as imprisonment and fines, though symbolically significant, rarely address the systemic and long-term damage inflicted on ecosystems and communities. A shift toward restorative judicial orders is therefore essential, making environmental remediation a central, enforceable component of criminal sentencing.

Under this model, courts would move beyond punishment to mandate ecological restoration, compelling offenders to rehabilitate damaged environments, fund conservation projects, or implement long-term recovery programs. Such obligations must be statutory, not discretionary, with noncompliance resulting in additional penalties or civil enforcement. Recognizing restoration as a core element of justice requires explicit sentencing guidelines that define the scope of reparation, assessment methods, and monitoring duration. Courts should be authorized to commission environmental assessments, require offenders to submit remediation plans, and appoint independent experts to oversee compliance.

Several European jurisdictions have piloted restorative sentencing mechanisms. In Germany, environmental courts have imposed conditional sentences contingent on ecosystem restoration, while in France, offenders may be ordered to replant forests, restore polluted rivers, or finance biodiversity projects under prosecutorial supervision. These measures integrate ecological repair into sentencing through binding timelines, technical standards, and measurable outcomes.[39]

For Indonesia, institutionalizing post-sentence monitoring and restorative supervision would embed environmental accountability within the justice system. Courts should retain jurisdiction to review compliance and ecological recovery, adapting orders as needed. Corporate offenders could also be required to support community resilience and traditional ecological knowledge programs. Integrating restoration into punishment thus transforms criminal law from a retributive system into a restorative and ecological one, aligning justice with sustainability and long-term environmental responsibility.

A critical juridical transformation in environmental justice involves recognizing collective and non-human victims by granting legal standing to communities, ecosystems, or species harmed by transboundary environmental crimes.[40] Litigation in Indonesia, where coastal communities sought

[37] Susana Borràs, "New Transitions from Human Rights to the Environment to the Rights of Nature," *Transnational Environmental Law* 5, no. 1 (April 1, 2016): 113–43, https://doi.org/10.1017/S204710251500028X.

[38] Rawnak Miraj Ul Azam, Syeda Afroza Zerin, and Fahim Faisal Khan Alabi, "The Rights of Nature Movement: Legal, Cultural, and Policy Challenges in Implementing Eco-Centric Laws," *Journal of Environmental Law and Policy* 4, no. 3 (December 1, 2024): 87–116, https://doi.org/10.33002/JELP050104.

[39] Sélim Brihi, "Environmental Criminal Law in the French Legal Framework," International Bar Association, 2022, https://www.ibanet.org/environmental-criminal-law-in-the-French-legal-framework?

[40] Joshua C. Gellers, "Earth System Law and the Legal Status of Non-Humans in the Anthropocene," *Earth System Governance* 7 (March 1, 2021): 1–5, https://doi.org/10.1016/J.ESG.2020.100083.

redress for illegal sand mining, illustrates the limitations of traditional doctrines that exclude communal claims from criminal compensation. A victim-centered framework would authorize NGOs or community coalitions to pursue collective claims grounded in statutory rights rather than discretionary state action.

Institutional reform is essential to implement this model. Prosecutors require training in ecological science and Indigenous rights; courts must develop the capacity to assess collective and long-term harms; and administrative agencies need clear mandates to facilitate community participation and enforce ecological restoration. Specialized environmental prosecution units in countries such as Germany, Brazil, and Canada demonstrate how embedding environmental victim advocates in criminal proceedings can ensure that affected communities are represented and that legal processes integrate ecological expertise.

Cross-border pollution further complicates victim protection. When harm originating in one state affects ecosystems or populations in another, justice must operate beyond national jurisdictions. Victim-centered adjudication therefore necessitates transnational cooperation through mutual legal assistance, coordinated investigations, and cross-border victim referral systems. Instruments such as the Aarhus Convention and the EU Environmental Liability Directive provide partial precedents, but their integration into criminal law remains limited. Establishing transnational mechanisms could enable victims in affected states to file criminal claims in the offender's jurisdiction or seek redress before international environmental tribunal.[41]

3. Strengthening Indonesia's Legal Response to Transnational Environmental Harm: Lessons from Global Best Practices

Indonesia's current institutional framework comprising the Ministry of Environment and Forestry (KLHK), the National Police (POLRI), BARESKRIM, and the Attorney General's Office lacks explicit provisions for collaboration on cross-border environmental crimes. Enforcement remains largely focused on domestic hotspots, such as palm oil plantations in Sumatra and mining areas in Kalimantan. When environmental offenses involve transnational elements, such as sand exports to Singapore or wildlife trafficking to Malaysia, legal responses are often limited or deferred to customs agencies. Institutional mandates must therefore be restructured to authorize coordinated task forces with cross-border investigative powers and rapid information-sharing protocols within ASEAN. Establishing mechanisms such as an ASEAN Environmental Crimes Enforcement Network or a treaty-based mutual legal assistance framework would significantly enhance regional enforcement capacity.

Global models provide instructive precedents. In the European Union, the 2008 Environmental Crime Directive harmonized criminal provisions across member states, facilitating cross-border investigations, extraditions, and victim participation. Germany's Environmental Crimes Act extends jurisdiction to transboundary pollution and illegal waste shipment, while the Netherlands' duty-of-care doctrine holds corporations accountable for ecological harm abroad. These frameworks demonstrate how criminal law can transcend territorial limits to address globalized environmental harm.

Indonesia could adopt similar measures by introducing extraterritorial jurisdiction for environmental crimes, enabling prosecution of Indonesian individuals and corporations for offenses committed abroad. This nationality-based principle could be codified through amendments to Law No. 32/2009 or revisions to the Criminal Code (KUHP). Strengthening the penalty structure to include ecological restoration, community compensation, and public remediation alongside imprisonment and fines would integrate restorative principles directly into criminal enforcement, ensuring ecological accountability is mandatory rather than discretionary.

[41] Magdalena Michalak and Przemysław Kledzik, "The Aarhus Convention and Polish Regulations Concerning Parties to Proceedings for Issuing the Eia Decisions," *Journal for European Environmental & Planning Law* 18, no. 1–2 (February 10, 2021): 56–76, https://doi.org/10.1163/18760104-18010005.

Indonesia could strengthen its environmental governance by establishing a specialized Environmental Crimes Tribunal or a dedicated judicial and prosecutorial unit. Such a body would integrate expertise in forensic ecology, transnational environmental law, and victim advocacy, ensuring more consistent and informed adjudication. Comparative models exist in Canada, where specialized prosecutors manage complex environmental litigation, and in Brazil, where federal environmental courts address cross-border ecological crimes. These institutions demonstrate how specialization can enhance procedural efficiency, victim-centered hearings, and the enforcement of binding remediation orders.

Equally important is the protection and recognition of victims. Indonesia currently lacks provisions recognizing collective and non-human victims in criminal proceedings. Legal reform could grant statutory standing to Indigenous communities, fishing cooperatives, and affected ecosystems, allowing them to file complaints, seek interim restitution, and request ongoing environmental monitoring. Incorporating Restorative Environmental Justice Panels where offenders, community representatives, and environmental officials collaboratively design remediation plans would mirror the Māori co-governance tribunals of New Zealand. This approach could reorient prosecutions toward ecological restoration and social reconciliation.

At the regional level, Indonesia's role within ASEAN presents an opportunity to propose an ASEAN Environmental Mutual Assistance Treaty, ratified by member states. Such an instrument would facilitate joint investigations, asset recovery, extradition of environmental offenders, and shared ecological data systems. The Mercosur Environmental Cooperation Agreement, which enables cross-border evidence collection, provides a relevant precedent. Adopting a similar framework would enhance Indonesia's capacity to address transnational environmental crimes, including wildlife trafficking, that exploit porous maritime borders and complex logistical networks.

Riau sand-smuggling case underscores Indonesia's urgent need for a coherent legal and institutional response to transnational environmental crime. Massive illegal sand extraction and export to Singapore caused coastal erosion, island loss, and livelihood damage, yet enforcement remained fragmented under customs, fisheries, and mining authorities rather than a unified criminal framework. The case highlights the need for explicit statutory offenses addressing cross-border resource exploitation, trafficking, and ecosystem destruction, paired with restorative measures such as funding rehabilitation, mangrove replanting, and community compensation. Coordinated task forces uniting KLHK, KKP, the Water and Air Police, and the Navy under a joint investigative framework could prevent jurisdictional overlap, while embedding community participation would transform prosecution into a process of ecological recovery and local empowerment.

Strengthening Indonesia's environmental criminal justice system also requires integrating legal education, participatory mechanisms, and comprehensive law reform. Training judges, prosecutors, and law enforcement in transboundary environmental law and victim-centered justice, alongside institutional innovations like Ecological Impact Criminal Reports and Ecological Damage Claims, would embed data-driven accountability and community involvement in court processes. Legislative reform—updating UU No. 32/2009 for extraterritorial reach, explicit victim restitution, and inter-ministerial investigative powers, together with environmental chapters in the KUHP would align administrative and criminal enforcement. A unified legal framework, supported by hybrid sanctioning models, would streamline prosecution, enhance deterrence, and position Indonesia within global standards of ecological justice and transnational accountability.

Indonesia's fight against transnational environmental crime requires not only legal and institutional reforms but also political will and active civil society participation. Community-led monitoring in coastal, border, and forest areas empowers locals, while NGOs such as WALHI, ICEL, and ELSAM link grassroots knowledge to legal advocacy. A protected investigative press enhances transparency and accountability, and judicial and parliamentary oversight must institutionalize impact assessments, public hearings, and reform evaluations. Together, these

mechanisms shift governance from a technocratic exercise to a system of shared ecological stewardship.

An effective response also demands an integrated reform model: statutory innovation, extraterritorial jurisdiction, specialized institutions, victim-centered justice, and international cooperation. Criminalizing cross-border harms such as illegal waste export, maritime pollution, and deforestation financing and recognizing communities, ecosystems, and future generations as victims reorients justice toward ecological restoration. Strengthened environmental courts ensure procedural and scientific capacity, while active engagement in ASEAN and global regimes positions Indonesia as a leader in ecological justice, balancing national sovereignty with transboundary responsibility.

C. Conclusion

Transnational environmental crime is a pressing global challenge that exposes the limits of legal frameworks based on territorial sovereignty and domestic criminal law. Crimes such as illegal resource extraction, cross-border pollution, hazardous waste dumping, and trafficking of protected species exploit regulatory gaps, weak enforcement, and the lack of binding international criminal standards. Although countries like Germany and the Netherlands have measures to criminalize environmental harm, these provisions are fragmented and fail to address the cross-border and systemic nature of ecological damage. International treaties such as the Basel Convention and CITES depend on national implementation and lack coercive criminal mechanisms.

Victim-centered environmental justice offers an alternative by broadening the concept of victim to include Indigenous peoples, coastal communities, future generations, and ecosystems. This approach shifts environmental criminal law from purely retributive aims toward restorative and reparative principles, emphasizing ecological rehabilitation and community empowerment. For Indonesia, a country with high biodiversity and significant exposure to transnational environmental threats, current frameworks such as Law No. 32/2009 and the Criminal Code are inadequate. Adopting extraterritorial provisions, specialized enforcement institutions, and mechanisms for victim participation would allow Indonesia to develop a more inclusive legal framework capable of addressing cross-border environmental harm.

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