



Wildlife Poaching: An Environmental Law Analysis of Transnational Organized Crime Networks

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Abstract: Wildlife poaching has increasingly become part of transnational organized crime networks that threaten biodiversity conservation and weaken environmental governance in many regions, including Aceh, Indonesia. This study aims to analyze wildlife poaching in Aceh from an environmental law perspective, with particular attention to the legal frameworks, enforcement mechanisms, and institutional challenges in addressing transnational wildlife crime. The research seeks to identify how existing legal instruments regulate wildlife protection and assess the extent to which these regulations can address organized criminal networks involved in illegal wildlife trade. This study employs a qualitative juridical approach using normative and empirical legal analysis. The research examines national environmental and wildlife protection laws, international legal instruments, and relevant enforcement practices related to wildlife crime. Data were collected through document analysis of legislation, policy reports, and scholarly literature, complemented by secondary data on wildlife crime cases in Aceh. The analytical framework integrates environmental law, transnational organized crime studies, and green criminology to understand the legal and institutional dynamics surrounding wildlife poaching. The findings reveal that wildlife poaching in Aceh is not merely a local environmental offense but is closely connected to broader transnational trafficking networks that exploit regulatory gaps, limited enforcement capacity, and coordination challenges among institutions. Although Indonesia has established several legal instruments to protect wildlife and combat environmental crimes, weaknesses remain in implementation, cross-border cooperation, and the integration of environmental law with criminal justice mechanisms. Strengthening institutional coordination, improving investigative capacity, and aligning domestic regulations with international frameworks are essential to addressing the complexity of wildlife crime networks. This study contributes to the growing discourse on environmental law and transnational environmental crime by providing a legal analysis of wildlife poaching within the context of organized criminal networks.

Keywords: Environmental Law; Transnational Organized Crime; Wildlife Poaching; Wildlife Protection.



Introduction

Wildlife crime has emerged as one of the most serious environmental challenges of the twenty-first century, threatening biodiversity, ecological balance, and sustainable development across many regions of the world.¹ Among the various forms of environmental crime, wildlife poaching has attracted increasing global attention because it is no longer a purely local conservation issue but has evolved into a complex transnational organized crime activity.² The illegal trade in wildlife and wildlife products is now widely recognized as one of the most lucrative illicit markets globally, alongside drug trafficking, human trafficking, and arms smuggling.³ Organized criminal networks exploit regulatory gaps, weak law enforcement, and high international demand for wildlife products, thereby creating sophisticated trafficking chains that operate across national borders.⁴ In this context, wildlife poaching is not merely an environmental violation but also a significant legal and governance challenge that requires stronger regulatory frameworks and coordinated enforcement mechanisms.⁵

Indonesia, as one of the world's most biodiverse countries, faces significant threats from wildlife poaching and illegal wildlife trade.⁶ The country hosts a wide range of endemic and endangered species, many of which have become prime targets for illegal hunting and trafficking due to their high economic value in international markets.⁷ Despite several legal instruments regulating wildlife protection—such as Law No. 5 of 1990 on the Conservation of Living Natural Resources and Their Ecosystems, as well as various implementing regulations—illegal hunting and trafficking continue to persist in many regions. The persistence of wildlife crime indicates that existing regulatory frameworks and enforcement mechanisms

¹ Navaneeth Bhaskar, Priyanka Tupe Waghmare, and Aswathy Maruthompilli Ajithkumar, 'Deep Learning-Driven Smart Surveillance System for Wildlife Conservation and Anti-Poaching Efforts', *Lect. Notes Networks Syst.* 1726 LNNS (2026): 294–301, https://doi.org/10.1007/978-3-032-11453-2_25.

² Patricia Mateo-Tomás et al., 'Leveraging Animal Tracking to Combat Wildlife Crime: GPS-Tagged Vultures and Wolves as Sentinels of Other Species' Poaching', *BioScience* 75, no. 12 (2025): 1058–65, <https://doi.org/10.1093/biosci/biaf136>.

³ Antony John Lynam et al., 'The Rising Tide of Conservation Technology: Empowering the Fight against Poaching and Unsustainable Wildlife Harvest', *Frontiers in Ecology and Evolution* 13 (2025), <https://doi.org/10.3389/fevo.2025.1527976>.

⁴ I. H. Loh et al., 'Strengthening Wildlife Protection Law in Malaysia to Deter Poaching', in *Environmental Management and Sustainable Development: Case Studies and Solutions from Malaysia*, ed. Mohd Armi Abu Samah and Mohd Khairul Amri Kamarudin (Springer International Publishing, 2022), 115–123, https://doi.org/10.1007/978-3-030-93932-8_8.

⁵ Henk Harmsen et al., 'Comparing Law Enforcement Monitoring Data and Research Data Suggests an Underestimation of Bushmeat Poaching through Snaring in a Kenyan World Heritage Site', *African Journal of Ecology* 59, no. 4 (2021): 912–923, <https://doi.org/10.1111/aje.12879>.

⁶ Dian Risdianto et al., 'Examining the Shifting Patterns of Poaching from a Long-Term Law Enforcement Intervention in Sumatra', *Biological Conservation* 204 (2016): 306–312, <https://doi.org/10.1016/j.biocon.2016.10.029>.

⁷ Muhammad Bima Saxti and Emy Rosnawati, 'Strengthening Legal Framework for Wildlife Poaching Prevention in Indonesia: Peningkatan Kerangka Hukum Untuk Pencegahan Perburuan Liar Satwa Liar di Indonesia?', *Indonesian Journal of Law and Economics Review* 20, no. 1 (February 2025): <https://doi.org/10.21070/ijler.v20i1.1369>.

have not yet been fully effective in addressing the increasingly complex nature of environmental crime networks.⁸ In particular, the connection between local poaching activities and transnational trafficking networks raises questions regarding the adequacy of environmental law in responding to organized criminal operations that extend beyond national jurisdictions.⁹

Aceh represents an important case study in examining the dynamics of wildlife poaching within the broader context of environmental law enforcement. Located in the northern part of Sumatra, Aceh is home to rich biodiversity and forms part of the Leuser Ecosystem, one of the last remaining habitats for several critically endangered species, including the Sumatran tiger, Sumatran elephant, and Sumatran orangutan. The ecological significance of this region makes it a crucial conservation area not only for Indonesia but also for global biodiversity protection. However, the same ecological richness also makes the region vulnerable to wildlife poaching and illegal wildlife trade. Reports from conservation organizations and law enforcement agencies have documented numerous cases of illegal hunting and trafficking involving protected species in Aceh.¹⁰ These activities are often facilitated by organized networks that connect local hunters with national and international trafficking syndicates, illustrating how wildlife crime in the region operates within broader transnational structures.

From a legal perspective, the persistence of wildlife poaching in Aceh raises important questions regarding the effectiveness of environmental law in addressing transnational environmental crime. Environmental law traditionally focuses on conservation regulations, administrative sanctions, and domestic enforcement mechanisms. However, the increasing involvement of organized crime networks in wildlife trafficking suggests that wildlife crime should also be understood through the lens of criminal law and transnational legal governance. This requires a more integrated legal approach that not only emphasizes conservation but also addresses the organized and transnational dimensions of wildlife crime. In this regard, analyzing wildlife poaching through the framework of environmental law provides an opportunity to examine how legal systems respond to environmental offenses that intersect with broader criminal networks.

Several previous studies have examined wildlife crime and environmental law enforcement from different perspectives. First, research on wildlife trafficking has highlighted the role of transnational criminal networks in facilitating illegal wildlife trade across borders.¹¹ These studies emphasize the economic incentives and global market structures that drive wildlife crime, as well as the challenges law enforcement agencies face in combating organized environmental crime. However, much of this research tends to focus on criminological or

⁸ Fathi Hanif, 'Upaya Perlindungan Satwa Liar Indonesia Melalui Instrumen Hukum Dan Perundang-Undangan', *Jurnal Hukum Lingkungan Indonesia* 2, no. 2 (2015): 29–48, <https://doi.org/10.38011/jhli.v2i2.24>.

⁹ Sofiyani et al., 'Drivers of Turnover Intentions and Vulnerability to Employee Poaching: A Study of Permanent Lecturers in Indonesian Private Universities', *Journal of Logistics, Informatics and Service Science* 11, no. 12 (2024): 90–115, <https://doi.org/10.33168/JLISS.2024.1205>.

¹⁰ Wahyuddin Wahyuddin et al., 'The Role of Government in Illegal Fishing Prevention to Increase Fishermen's Economic Welfare in Aceh Province', *Jurnal Ilmiah Peuradeun* 7, no. 2 (May 2019): 357–368, <https://doi.org/10.26811/peuradeun.v7i2.189>.

¹¹ Meganne Natali, 'Reinforcing the Global Fight against Illegal Wildlife Trade: Addressing CITES's Discretion and Fragmented Legal Framework', *Yearbook of International Environmental Law* 35, no. 1 (January 2024): yvaf005, <https://doi.org/10.1093/yiel/yvaf005>.

conservation perspectives rather than examining the issue through a comprehensive environmental law framework. As a result, the legal dimensions of wildlife crime—particularly the interaction between environmental regulation and organized crime—remain insufficiently explored.

Second, several studies have examined the effectiveness of wildlife protection laws in Indonesia. These studies generally assess the implementation of national legislation, institutional capacity, and enforcement challenges related to wildlife conservation.¹² While these studies provide valuable insights into regulatory frameworks and policy implementation, they often treat wildlife poaching as a domestic conservation issue rather than as part of a broader transnational crime network. Consequently, the connection between local poaching activities and international trafficking systems has not been adequately analyzed within the context of environmental legal governance. Third, research grounded in green criminology has contributed to understanding wildlife crime as an environmental harm involving complex social, economic, and ecological dimensions.¹³ Green criminology emphasizes the structural drivers of environmental crime and highlights the role of power, inequality, and global demand in shaping illegal wildlife markets. Nevertheless, this body of literature tends to prioritize criminological analysis over legal analysis, leaving a gap in understanding how environmental law can be mobilized to address wildlife crime linked to transnational organized networks.

Given these limitations, a significant research gap remains in integrating environmental law analysis into the study of transnational organized wildlife crime. Existing studies either emphasize conservation policy, criminological perspectives, or domestic law enforcement, but relatively few examine wildlife poaching through a legal framework that explicitly connects environmental regulation with transnational organized crime structures. In addition, empirical discussions focusing specifically on Aceh remain limited, despite the region's strategic importance for biodiversity conservation and as a route for wildlife trafficking. This gap underscores the need for a legal analysis that situates wildlife poaching within the broader framework of environmental governance and transnational criminal networks. The novelty of this research lies in its effort to bridge environmental law analysis with the study of organized wildlife crime networks. Unlike previous studies that primarily approach wildlife crime from conservation or criminological perspectives, this research examines wildlife poaching in Aceh through the lens of environmental law while simultaneously considering its connections to transnational organized crime. By integrating environmental legal analysis with insights from organized crime studies, this research offers a more comprehensive understanding of how wildlife crime operates and how legal frameworks can respond to such challenges. Furthermore, the study contributes a region-specific perspective by focusing on Aceh, a critical biodiversity area facing increasing pressure from wildlife trafficking networks. Based on the above discussion, this study seeks to address the following research question: How does environmental law address wildlife poaching in Aceh within the context of transnational

¹² Agus Agus and Aditiarman Aditiarman, 'Organized Crime in the Trade of Endangered Fauna: A Study of Environmental Law and Criminal Law Policies and Their Enforcement in Indonesia', *Jurnal Sosial, Sains, Terapan Dan Riset (Sosateris)* 13, no. 2 (June 2025): 48–56, <https://doi.org/10.35335/n13cxm42>.

¹³ Aalayna R. Green, 'A Critical Environmental Justice Framework for the Illegal Wildlife Trade', *Frontiers in Conservation Science* 6 (February 2025), <https://doi.org/10.3389/fcosc.2025.1535093>.

organized crime networks, and to what extent are existing legal frameworks capable of responding to these challenges?

The significance of this research is threefold. First, from a theoretical perspective, the study contributes to the development of environmental law scholarship by linking it with the emerging discourse on transnational environmental crime. Second, from a policy perspective, the research provides insights into the strengths and limitations of existing legal frameworks for addressing wildlife crime, offering recommendations to improve regulatory and enforcement mechanisms. Third, from a practical perspective, the study highlights the importance of strengthening institutional coordination, cross-border cooperation, and integrated legal strategies in combating wildlife poaching and illegal wildlife trade. By examining wildlife poaching in Aceh through an environmental law perspective, this research aims to contribute to broader efforts to enhance biodiversity protection and strengthen legal governance in addressing transnational environmental crime.

Method

This study employs a qualitative legal research approach¹⁴ with an emphasis on normative and analytical environmental law analysis to examine wildlife poaching in Aceh within the context of transnational organized crime networks. The research focuses on analyzing legal frameworks governing wildlife protection, environmental conservation, and criminal law enforcement related to wildlife crime. The study adopts a doctrinal legal method by examining relevant national regulations, including Indonesian environmental and wildlife protection laws, as well as international legal instruments addressing wildlife trafficking and transnational environmental crime. In addition, the research incorporates a socio-legal perspective to understand how legal norms interact with institutional practices in addressing wildlife poaching. Data collection was conducted through documentary research, including the analysis of legislation, policy reports, court decisions, government publications, and scholarly journal articles related to wildlife crime, environmental law enforcement, and transnational organized crime.

The collected data were analyzed using a qualitative content analysis, which systematically interprets legal texts, policy documents, and secondary data to identify patterns, regulatory gaps, and institutional challenges in addressing wildlife poaching linked to organized crime networks. The analysis also employs a comparative and interpretive legal approach to assess how existing environmental law frameworks address the transnational nature of wildlife crime. To ensure the reliability and credibility of the findings, the study employs data triangulation by comparing information from legal documents, academic literature, and institutional reports on wildlife protection and environmental crime enforcement. Furthermore, the validity of the analysis is strengthened through analytical consistency and cross-referencing of sources, allowing the research to present a comprehensive and balanced evaluation of environmental law governance in addressing wildlife poaching in Aceh.

¹⁴ Matthew B. Miles and A. Michael Huberman, *Analisis Data Kualitatif: Buku Sumber Tentang Metode-Metode Baru* (Jakarta: Universitas Indonesia Press, 2014).

Results and Discussion

Wildlife Poaching in Aceh: Patterns, Actors, and Transnational Crime Networks

Wildlife poaching in Aceh represents a significant environmental and legal challenge due to its close connection with broader transnational organized crime networks.¹⁵ Aceh is located within the Leuser Ecosystem, one of the most biologically diverse regions in Southeast Asia and the last stronghold for several critically endangered species, including the Sumatran tiger (*Panthera tigris sumatrae*), Sumatran elephant (*Elephas maximus sumatranus*), and Sumatran orangutan (*Pongo abelii*). Despite the ecological importance of this region, wildlife poaching has continued to occur in various forms, ranging from opportunistic hunting by local actors to organized illegal wildlife trade that connects rural hunting areas with regional and international markets.¹⁶ The results of this study show that wildlife poaching in Aceh generally follows a structured chain involving multiple actors who operate at different levels within the illegal wildlife trade network. At the local level, poachers are often individuals or small groups who possess knowledge of forest ecosystems and wildlife habitats. These actors are typically motivated by economic incentives, as wildlife products such as tiger skins, elephant ivory, and exotic animals command high prices in illicit markets. Local hunters often operate in remote forest areas where monitoring and law enforcement presence are limited.

However, the involvement of local hunters represents only the first stage of a broader illegal trade network.¹⁷ After the initial hunting activity, wildlife products are usually transferred to intermediaries who function as collectors or brokers.¹⁸ These intermediaries coordinate the transportation of wildlife products from rural areas to urban centers, where they are further distributed through domestic or international trafficking routes.¹⁹ In many cases, the networks extend beyond national borders, linking local poaching activities with transnational trafficking syndicates that supply illegal wildlife markets in other countries. The analysis of documented wildlife crime cases in Aceh reveals that organized criminal networks frequently exploit logistical and regulatory weaknesses in wildlife protection systems. These networks rely on informal transportation routes, corruption vulnerabilities, and insufficient cross-border monitoring to move wildlife products across regions. As a result, wildlife poaching cannot be

¹⁵ Saifuddin Saifuddin, 'Model Penegakan Hukum Pidana Terhadap Tindak Pidana Pembunuhan Satwa Gajah (*Elephas Maximus*) Yang Dilindungi Di Aceh Jaya' (Masters, Universitas Islam Sultan Agung Semarang, 2025), <https://Repository.Unissula.Ac.Id/42263/>.

¹⁶ Mira Salviana, Abdullah Abdullah, and Mimie Saputri, 'Habitat Conditions Malayan Porcupine (*Hystrix Brachyura*) in Captivity Deer Park Village Lamtanjong District of Aceh and Village Panton Luas South Aceh Regency', no. 1 (Journal:eArticle, Syiah Kuala University, 2017), <https://www.neliti.com/publications/202699/>.

¹⁷ Wiyata Yudha Lesmana and Rachmad Abduh, 'Criminal Law Policy on the Protection of Protected Wildlife', *Al-Manhaj* 6, no. 1 (July 2024), <https://doi.org/10.37680/almanhaj.v6i1.5029>.

¹⁸ Risa Anjayani et al., 'Legal Enforcement of Illegal Trade in Protected Wild Animals in The Region Resor Konservasi XXIII Cirebon', *Indonesian Journal of Multidisciplinary Science* 3, no. 8 (May 2024), <https://doi.org/10.55324/ijoms.v3i8.888>.

¹⁹ Muhammad Ikhsan Lubis, 'Implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and Law No. 5 of 1990 in Law Enforcement Efforts and Guarantees of Environmental Rights in Gunung Leuser National Park, Indonesia', *Journal of Indonesian Legal Studies* 2, no. 1 (August 2017): 55–78, <https://doi.org/10.15294/jils.v2i01.16635>.

understood solely as a local conservation issue but must be viewed as part of a broader system of transnational environmental crime. The structure of wildlife poaching networks in Aceh can be illustrated as follows:

Table 1. Structure of Wildlife Poaching Networks and Associated Legal Challenges

Level of Network	Main Actors	Roles in Wildlife Crime	Legal Challenges
Local Level	Hunters / Local Poachers	Capture or kill protected wildlife	Limited monitoring and economic incentives
Intermediary Level	Brokers / Collectors	Collect and transport wildlife products	Weak regulatory oversight
National Distribution	Domestic Traders	Distribute wildlife products across regions	Enforcement coordination gaps
International Level	Transnational Crime Syndicates	Export wildlife products to global markets	Cross-border jurisdiction limitations

Source: Author's Interpretation

The table illustrates the multi-layered structure of wildlife poaching networks that operate from the local to the international level. At the local level, the main actors are hunters or local poachers who directly capture or kill protected wildlife in forest areas. These activities are often driven by economic incentives and the limited availability of alternative livelihoods in communities surrounding conservation areas. The main legal challenge at this stage lies in the limited monitoring systems in vast, remote forest regions, which make poaching difficult to detect for law enforcement authorities. Once wildlife has been hunted, the products are typically transferred to intermediaries or collectors, who gather and transport them from remote locations into broader trade networks. At this level, weak regulatory oversight is frequently exploited to move illegal wildlife products without detection.

At the national distribution level, domestic traders play a significant role in distributing wildlife products across different regions within the country. They often act as intermediaries between collection networks and larger markets, either for domestic consumption or as part of routes leading to international trafficking. The legal challenge at this stage concerns limited coordination among law enforcement agencies, leading to fragmented enforcement efforts. At the highest stage, the international level, transnational organized crime syndicates facilitate the export of wildlife products to global markets with high demand. These networks exploit cross-border legal loopholes and jurisdictional limitations in international law enforcement. Therefore, the tiered structure of this network demonstrates that wildlife poaching is not merely a local environmental offense but part of a broader global system of illegal wildlife trade, requiring a more integrated legal approach and stronger international cooperation.

Environmental Law Framework Governing Wildlife Protection in Indonesia

From a legal perspective, Indonesia has established several regulatory frameworks to protect wildlife and combat environmental crime.²⁰ These frameworks include national legislation on conservation and environmental protection, as well as criminal sanctions against illegal wildlife trade. However, the effectiveness of these regulations largely depends on their

²⁰ Reh Bungana Beru Perangin-angin et al., 'Penegakan Hukum Terhadap Kejahatan Atas Satwa Liar Yang Dilindungi Di Taman Nasional Gunung Leuser : (Law Enforcement Against Crime On Protected Wild Animals In Gunung Leuser National Park)', *JURNAL HUKUM JUSTICE*, 3 August 2023, 11–19.

implementation and the capacity of institutions responsible for enforcement. The primary legal instrument governing wildlife protection in Indonesia is Law No. 5 of 1990 on the Conservation of Living Natural Resources and Their Ecosystems. This law provides the legal basis for protecting endangered species and regulating conservation areas. It prohibits activities such as capturing, killing, possessing, transporting, or trading protected wildlife without proper authorization. Violations of these provisions may result in criminal sanctions, including imprisonment and fines.²¹

In addition to this legislation, wildlife protection is also supported by environmental governance frameworks such as Law No. 32 of 2009 on Environmental Protection and Management, which establishes broader environmental accountability principles. At the international level, Indonesia is also a party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which regulates cross-border trade in endangered wildlife species.²² The interaction between these national and international legal frameworks forms the legal basis for combating wildlife trafficking. However, the findings of this study indicate that several regulatory and institutional gaps still exist in the enforcement of these laws. The key legal instruments related to wildlife protection can be summarized as follows:

Table 2. Legal Framework Governing Wildlife Protection and Wildlife Crime in Indonesia

Legal Framework	Scope of Regulation	Relevance to Wildlife Crime
Law No. 5/1990	Conservation of natural resources and wildlife protection	Criminalizes poaching and illegal wildlife trade
Law No. 32/2009	Environmental protection and management	Provides environmental governance principles
Government Regulations	Technical conservation regulations	Operational rules for wildlife management
CITES Convention	International trade in endangered species	Regulates cross-border wildlife trafficking

Source: Author's Interpretation

The table illustrates the legal framework that underpins wildlife protection and the prevention of poaching and illegal wildlife trade in Indonesia. Law No. 5 of 1990 concerning the Conservation of Living Natural Resources and Their Ecosystems serves as the primary legal instrument regulating wildlife protection, including prohibitions on capturing, killing, possessing, transporting, or trading protected species without proper authorization. This law provides the legal foundation for imposing criminal sanctions on individuals involved in poaching and illegal wildlife trade. Meanwhile, Law No. 32 of 2009 on Environmental Protection and Management establishes a broader framework for environmental governance, including principles of state responsibility, environmental protection, and mechanisms for environmental law enforcement that support biodiversity conservation.

²¹ Fathi Hanif, 'Upaya Perlindungan Satwa Liar Indonesia Melalui Instrumen Hukum Dan Perundang-Undangan', *Jurnal Hukum Lingkungan Indonesia* 2, no. 2 (2015): 29–48, <https://doi.org/10.38011/jhli.v2i2.24>.

²² Firdaus Zul Faqqaur Ananta Yudha, Margaretha Hanita, and Stanislaus Riyanta, 'The Threat of Protected Flora and Fauna Smuggling In Indonesia as A Transnational Organized Crime From The Perspective of Customs and Excise', *Asian Journal of Social and Humanities* 3, no. 2 (November 2024): 273–85, <https://doi.org/10.59888/ajosh.v3i2.448>.

In addition to these laws, government regulations and technical conservation policies function as operational rules that guide wildlife management, the protection of conservation areas, and monitoring activities aimed at preventing damage to wildlife populations and habitats. At the international level, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) plays a crucial role in regulating cross-border trade in endangered species. This convention requires member states to control the export, import, and re-export of wildlife through a permit system to prevent overexploitation that threatens species survival. Consequently, the combination of national legal frameworks and international commitments creates a regulatory system intended to address wildlife poaching and illegal wildlife trade, including those involving transnational organized crime networks.

Although these legal instruments provide a strong normative foundation, implementing wildlife protection laws often faces several obstacles.²³ One major challenge lies in the limited enforcement capacity of relevant institutions, including forest rangers, environmental agencies, and law enforcement authorities.²⁴ In many cases, wildlife crimes occur in remote forest areas where monitoring and surveillance remain limited. Another significant challenge is the relatively low penalties for wildlife crimes compared to the high profits generated by illegal wildlife trade. Organized crime networks may view these penalties as manageable risks rather than effective deterrents. Consequently, stronger legal sanctions and improved enforcement mechanisms are necessary to address the economic incentives driving wildlife trafficking. Moreover, coordination between institutions involved in environmental governance and criminal law enforcement remains limited. Wildlife protection often involves multiple agencies, including environmental authorities, forestry departments, police units, and customs agencies. Without effective coordination, enforcement efforts may become fragmented and less effective in addressing the complex nature of wildlife crime networks.

Strengthening Environmental Legal Governance to Combat Transnational Wildlife Crime

Given the increasingly organized and transnational nature of wildlife crime, the traditional regulatory approach to environmental protection requires significant strengthening.²⁵ The findings of this study highlight the need for a more integrated legal governance framework that combines environmental regulation, criminal law enforcement, and international cooperation. One of the key issues identified in this research is the gap between regulatory frameworks and practical enforcement. While existing laws provide the legal basis for prosecuting wildlife crimes, enforcement practices often focus primarily on individual poachers rather than dismantling the broader criminal networks that facilitate wildlife trafficking. As a result,

²³ Anisa Fahlevi, 'Kajian Hukum Terhadap Tindak Pidana Penembakan Satwa Liar Yang Dilindungi (Studi Penelitian Kota Subulussalam)' (S1, Universitas Malikussaleh, 2024), <https://rama.unimal.ac.id/id/eprint/8694/>.

²⁴ Yevhen Leheza et al., 'Interpretation of Regulatory and Legal Acts in Contemporary Contexts: Foreign Experience, Comparative Perspectives, and Pathways for Regulatory Reform', *NUSANTARA: Journal Of Law Studies* 5, no. 1 (February 2026): 102–22, <https://doi.org/10.5281/zenodo.18727992>.

²⁵ Cut Maila Hanum et al., 'Peningkatan Kapasitas Masyarakat Dalam Mitigasi Konflik Manusia-Gajah Di Unit Pemukiman Transmigrasi Paya Guci Kabupaten Pidie Provinsi Aceh', *Panrita Abdi - Jurnal Pengabdian Pada Masyarakat* 6, no. 2 (January 2022): 227–34, <https://doi.org/10.20956/pa.v6i2.13045>.

enforcement efforts may produce short-term results but fail to disrupt the structural foundations of wildlife crime.²⁶

To address this challenge, environmental law enforcement must adopt a more strategic approach that targets the entire criminal network rather than only its lowest-level participants.²⁷ This requires improved investigative capacity, intelligence sharing, and collaboration between environmental authorities and criminal law enforcement agencies. Another important aspect is strengthening cross-border cooperation to combat wildlife trafficking. Because wildlife crime networks often operate across national boundaries, domestic legal enforcement alone is insufficient. International cooperation mechanisms—such as information exchange, joint investigations, and coordinated law enforcement operations—are essential to disrupt transnational trafficking routes. The main governance challenges and potential policy responses can be summarized in the following table:

Table 3. Governance Challenges and Policy Recommendations in Combating Wildlife Poaching

Governance Challenge	Description	Policy Recommendation
Weak enforcement capacity	Limited monitoring in remote forest areas	Increase institutional resources and ranger capacity
Regulatory fragmentation	Multiple institutions with limited coordination	Strengthen inter-agency coordination mechanisms
Low deterrence effect	Criminal penalties relatively low	Reform legal sanctions for wildlife crime
Transnational trafficking networks	Cross-border wildlife trade	Enhance international cooperation and intelligence sharing

Source: Author's Interpretation

The table outlines several governance challenges in addressing wildlife poaching and illegal wildlife trade, along with policy recommendations to strengthen wildlife protection efforts. One of the primary challenges is weak law enforcement capacity, particularly due to limited monitoring in remote and extensive forest areas. This condition makes it difficult to detect poaching activities at an early stage. To address this issue, it is necessary to enhance institutional resources, including increasing the number of forest rangers, strengthening investigative capacity, and providing more advanced monitoring technologies to improve surveillance systems in conservation areas.

In addition, the table indicates that regulatory and institutional fragmentation constitutes a significant barrier to effective wildlife crime prevention. The involvement of multiple institutions in environmental governance and law enforcement is often not accompanied by effective coordination, which creates gaps in policy implementation. Another challenge concerns the low deterrent effect of criminal sanctions, which are relatively mild compared to the substantial economic profits generated by illegal wildlife trade. Therefore, legal reforms aimed at strengthening sanctions are necessary to create stronger deterrence. Furthermore, the

²⁶ Ferry Anggriawan, 'Penegakan Hukum Perdagangan Satwa Liar (Hewan Kukang) Di Wilayah Kota Batu', *Esensi Hukum* 6, no. 2 (2024): 75–87, <https://doi.org/10.35586/esensihukum.v6i2.418>.

²⁷ 200106002 Rahmatun Nisa, 'Perlindungan Hukum Satwa Liar Dilindungi Di Aceh Dari Perburuan Dan Perdagangan Ilegal (Penelitian Di Balai Konservasi Sumber Daya Alam Aceh)', *Perlindungan Hukum Satwa Liar Dilindungi Di Aceh Dari Perburuan Dan Perdagangan Ilegal (Penelitian Di Balai Konservasi Sumber Daya Alam Aceh)*, no. 27 (August 2024): 1–27.

existence of transnational wildlife trafficking networks requires enhanced international cooperation, including information sharing, cross-border law enforcement coordination, and stronger intelligence mechanisms to disrupt illegal trade networks linked to organized crime.

In addition to legal reforms, technological innovations also play an important role in strengthening wildlife protection efforts. Technologies such as satellite monitoring, digital surveillance, and wildlife-tracking systems can enhance authorities' ability to detect and prevent illegal hunting.²⁸ Furthermore, data-driven monitoring systems can help identify patterns of wildlife trafficking and support more targeted enforcement strategies. Community participation also represents a critical component of effective wildlife governance. Many local communities living near conservation areas possess valuable knowledge about wildlife habitats and ecological conditions. Empowering local communities through conservation programs, economic incentives, and environmental education can reduce the incentives for poaching and strengthen grassroots-level conservation efforts.

From an environmental law perspective, these strategies highlight the importance of integrating legal, institutional, and social approaches to addressing wildlife crime. Environmental law should not only establish regulatory prohibitions but also facilitate coordinated governance mechanisms capable of addressing complex environmental crimes involving multiple actors and jurisdictions.²⁹ Ultimately, wildlife poaching in Aceh illustrates the broader challenge of environmental governance in the context of globalization. The increasing integration of illegal wildlife markets into transnational crime networks requires a corresponding evolution in legal frameworks and enforcement strategies. Environmental law must therefore adapt to address emerging forms of environmental crime that transcend traditional regulatory boundaries. In answering the research question posed in this study—how environmental law addresses wildlife poaching in Aceh within the context of transnational organized crime networks—the findings indicate that while Indonesia has established a normative legal framework for wildlife protection, significant challenges remain in enforcement, institutional coordination, and cross-border cooperation. Addressing these challenges requires a more integrated legal governance approach that combines environmental protection with criminal justice strategies to dismantle organized wildlife trafficking networks.

Conclusion

This study demonstrates that wildlife poaching in Aceh cannot be understood merely as an isolated environmental violation, but rather as part of a broader system of transnational organized crime networks that exploit ecological resources for economic gain. The findings indicate that poaching activities in the region involve multiple actors operating across different levels, ranging from local hunters and intermediaries to national distributors and international trafficking syndicates. Although Indonesia has established a normative legal framework to protect wildlife through conservation and environmental legislation, significant challenges remain in implementing and enforcing these regulations. Weak monitoring capacity in remote

²⁸ Diah Sagita Fitri et al., 'Strategi Kebijakan Konservasi Untuk Melindungi Satwa Dari Dampak Alih Fungsi Hutan', *Indonesian Journal of Economy and Education Economy* 2, no. 1 (January 2024): 283–91.

²⁹ Muhammad Haikal, 'Perlindungan Hukum Terhadap Gajah Sumatera Di Aceh: Undang-Undang KSDA Nomor 5 Tahun 1990', *Jurnal Iktibar Nusantara* 2, no. 1 (2023): 96–107, <https://doi.org/10.62901/j-ikhsan.v2i1.72>.

forest areas, fragmented institutional coordination, and relatively limited deterrent sanctions contribute to the persistence of wildlife crime. As a result, the effectiveness of environmental law in addressing wildlife poaching remains constrained by structural governance limitations and the increasingly sophisticated nature of transnational wildlife trafficking networks. Considering these findings, strengthening environmental legal governance is essential to combat wildlife crime more effectively. This includes enhancing inter-agency coordination, improving investigative capacity to target organized crime networks rather than focusing solely on individual poachers, and expanding international cooperation to address cross-border wildlife trafficking. In addition, integrating technological monitoring systems and encouraging community participation in conservation efforts may further support law enforcement strategies and biodiversity protection. Future research is recommended to explore empirical field data on wildlife trafficking networks and to examine the role of regional and international legal cooperation in combating transnational environmental crime. Such studies would contribute to a deeper understanding of the institutional and legal mechanisms necessary to strengthen wildlife protection and environmental governance in biodiversity-rich regions like Aceh.

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Author Contributions Statement

Kartina Pakpahan contributed to the conceptualization of the research, research design, and manuscript drafting. Sri Sulistyawati was responsible for developing the research framework, conducting data analysis, and critically revising the manuscript. Willy Tanjung contributed to data collection, literature review, and the preparation of the research findings. Sigar P. Berutu participated in data interpretation, manuscript editing, and overall supervision of the research process. All authors have read and approved the final version of the manuscript.

AI Usage Statement

The authors declare that artificial intelligence (AI) tools were utilized in a limited capacity solely to assist with language editing, grammatical refinement, formatting, and improving the overall clarity and readability of the manuscript. The use of these tools was intended solely to support the technical presentation of the text and did not affect the research's intellectual substance. AI assistance was applied during language polishing to ensure the manuscript met international academic writing standards. All ideas, research questions, methodological designs, data interpretations, analyses, and conclusions presented in this manuscript are entirely the original work of the authors. The authors take full responsibility for the accuracy, integrity, and originality of the content. Any outputs generated with the assistance of AI tools were carefully reviewed, verified, and edited by the authors to ensure alignment with scholarly standards,

ethical research practices, and the principles of academic integrity. No AI tools were used to generate research data, conduct analysis, or replace the authors' intellectual contributions to this study.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this study. This research was conducted independently and objectively, without any financial, commercial, institutional, or personal relationships that could be perceived as influencing the research process, findings, or interpretations presented in this manuscript. The authors affirm that no external funding bodies, organizations, or individuals exerted any influence on the design of the study, data collection, analysis, interpretation of results, or the decision to submit the manuscript for publication. Furthermore, the authors confirm that the study was carried out in accordance with the principles of academic integrity, transparency, and ethical research practices. All analyses and conclusions presented in this research reflect the independent scholarly judgment of the authors. The absence of competing interests ensures that the findings and discussions in this paper are presented solely to advance scientific knowledge and scholarly discourse in the field of environmental law and wildlife protection.

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