

Legal Culture, Environmental Non-Compliance, and the Persistence of Illegal Mining in Paningkaban

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Abstract

This study explores the socio-legal dynamics behind the persistence of illegal gold mining (PETI) in Paningkaban Village, Banyumas Regency, Central Java. Triggered by the July 2023 tragedy where eight miners perished, this research investigates why formal law enforcement has remained ineffective despite severe environmental harm. Using a qualitative socio-legal methodology with a hermeneutic approach, the study examines the intersection of legal culture and green criminology. Data were collected through in-depth interviews, field observations, and literature analysis. Findings reveal that PETI has been culturally legitimized through local philosophies like *sadumuk bathuk sanyari bumi ditohi pati*, a Javanese cultural expression emphasizing the sacred duty to protect one's land and community, even at the cost of life. The study concludes that PETI is socially perceived as a legitimate survival strategy, highlighting the urgent



need for culturally sensitive, participatory environmental governance rather than purely punitive measures.

Keywords

Legal Culture; Illegal Mining; Environmental Crime; Green Criminology.

HOW TO CITE:

Chicago Manual of Style Footnote:

¹ Baginda Khalid Hidayat Jati, Esmi Warassih Pujirahayu, Teddy Asmara, and Ridwan Arifin, “Legal Culture, Environmental Non-Compliance, and the Persistence of Illegal Mining in Paningkaban”, *Indonesian Journal of Criminal Law Studies* 10, no 1 (2025): 149-178, <https://doi.org/10.15294/ijcls.v10i1.24008>.

Chicago Manual of Style for Reference:

Jati, Baginda Khalid Hidayat, Esmi Warassih Pujirahayu, Teddy Asmara, and Ridwan Arifin, “Legal Culture, Environmental Non-Compliance, and the Persistence of Illegal Mining in Paningkaban”, *Indonesian Journal of Criminal Law Studies* 10, no 1 (2025): 149-178, <https://doi.org/10.15294/ijcls.v10i1.24008>.

Introduction

On July 25, 2023, a tragic accident shook the illegal mining landscape in Banyumas Regency, Central Java. Eight gold miners from Bogor were trapped in an unlicensed mining shaft in Grumbul Tajur, Pancurendang Village, Ajibarang Subdistrict, Banyumas. The event quickly went viral across national media, prompting an intense week-long rescue operation involving the National Search and Rescue Agency (SAR), the Indonesian Navy, and the Banyumas Police. Despite the coordinated efforts, the miners could not be saved, and the tragedy marked a turning point in how law enforcement responded to illegal gold mining (PETI) in the region.¹

For years, illegal mining had been conducted openly in Ajibarang, Gumelar, and surrounding areas with minimal interference. However, in the aftermath of the disaster, Banyumas Police launched a rare but forceful legal crackdown. Four individuals were named as suspects under Article 158 of the Indonesian Mining Law (UU Minerba), with one suspect still at large and believed to be involved in money laundering linked to long-running PETI operations dating back to 2014.² The arrests came as a surprising development, as the illegal gold mining operations had continued unchecked for years and were only prosecuted as criminal offenses after the case gained widespread public attention through its viral spread in the media.

This shift in enforcement reflects a broader tension in Indonesia's environmental legal system—between “law in the books” and “law in action,” a distinction first articulated by Roscoe Pound to highlight the gap between formal legal rules and how they are implemented or

¹ Khairina, “Tragedi Tambang Emas Di Banyumas, 8 Penambang Terkubur Di Lubang Galian Sedalam Puluhan Meter,” *Kompas.com*, 2023.

² Polresta Banyumas Divisi Humas, “Polresta Banyumas Tetapkan Empat Tersangka Kasus Tambang Emas Ilegal Di Ajibarang,” *Web Resmi Tribatanews Banyumas*, 2023.

experienced in practice.³ While laws clearly prohibit unauthorized mining, they are often inconsistently applied or socially resisted, especially in rural communities where mining has become a means of survival.⁴ This incident highlights the complex intersection of legality, legitimacy, and environmental harm—a dynamic further explored in this study.

Several studies have explored the complexities of illegal gold mining in Indonesia, highlighting the challenges of enforcement and the socio-economic factors that perpetuate these activities. For instance, Ongku P. Hasibuan in 2021 examined illegal gold mining camps in Kalimantan and found that even a combination of persuasive community approaches and harsh crackdowns by authorities did not fully stop mining; they emphasized the need for multifaceted solutions including alternative livelihoods, education, and regulatory reform.⁵ Similarly, Martanto and Nasihuddin in 2023 also analyzed illegal gold mining in Mount Botak, Maluku, which continues to cause significant environmental degradation despite repeated raids and government prohibitions. Their study highlighted the role of customary authorities in legitimizing mining activities, often bypassing formal regulation by issuing community-based “mining cards” to outside miners. This customary endorsement, combined with the lack of effective local legal policies, has perpetuated PETI and weakened environmental enforcement.⁶

Recent research by Hasyim Asyari also examined the fatal July 2023 mining accident in Pancurendang Village, Banyumas, where eight miners

³ Jean-Louis Halperin and Jean-Louis Halpérin, “Law in Books and Law in Action: The Problem of Legal Change,” *Maine Law Review* 64, no. 1 (2011): 45.

⁴ Kuat Puji Prayitno, Galih Pandu Ramadhan, and Faiz Nuha Ilmawan, “Law Enforcement’s Role in Tackling Illegal Gold Mining for Sustainable Development Goals,” *E3S Web of Conferences* 609 (2025), <https://doi.org/10.1051/e3sconf/202560907002>.

⁵ Ongku P. Hasibuan, Jann H. Tjakraatmadja, and Yos Sunitiyoso, “Illegal Gold Mining in Indonesia: Structure and Causes,” *International Journal of Emerging Markets* 17, no. 1 (2022): 177–97, <https://doi.org/10.1108/IJOEM-11-2019-0964>.

⁶ Dwiana Martanto and Abdul Aziz Nasihuddin, “Data-Based Policy as a Solution to Overcome Illegal Mining of Mount Botak, Buru Regency, Mollucas Province for Sustainable Development,” *Proceeding ICMA-SURE* 2, no. 1 (2023): 76, <https://doi.org/10.20884/2.procicma.2023.2.1.7793>.

were trapped in an unlicensed pit. Applying a Human Factors Analysis and Classification System (HFACS), their study classified contributing factors into five categories, including unsafe acts, poor supervision, and most notably, societal norms and economic dependence on illegal mining. The findings highlighted the strong influence of local social structures and the normalization of risk-taking behavior in the face of poverty and lack of alternatives.⁷

In addition to the studies mentioned, Rohman critically analyzes the legal enforcement framework for illegal mining in Indonesia especially in 2024, finding persistent institutional gaps and fragmented governance as key challenges.⁸ Meanwhile, Diah Ayu Rahmawati emphasizes the importance of a responsive and community-engaged enforcement strategy in addressing illegal mining, recommending improved coordination among authorities, stronger penalties, anti-corruption measures, and the development of alternative livelihoods for mining-dependent communities.⁹ These studies underline the institutional and procedural shortcomings that have enabled PETI to flourish, but still fall short in addressing how community norms and legal perceptions shape persistent non-compliance.

Despite these important contributions, previous studies have largely approached PETI from institutional, economic, and technical angles. They have emphasized regulatory weaknesses, poverty-driven dependency, and unsafe labor conditions, but often neglect the underlying

⁷ Hasyim Asyari et al., "Investigating of Mining Accidents Involving Trapped Mine Workers: A Human Factors-Based Method for Analysis and Classification (a Case Study of an Illegal Gold Mining in Banyumas, Indonesia)," *SHS Web of Conferences* 189 (2024): 01025, <https://doi.org/10.1051/shsconf/202418901025>.

⁸ Arif Rohman, Hartiwiningsih, and Muhammad Rustamaji, "Illegal Mining in Indonesia: Need for Robust Legislation and Enforcement," *Cogent Social Sciences* 10, no. 1 (2024), <https://doi.org/10.1080/23311886.2024.2358158>.

⁹ Diah Ayu Rahmawati, Budi Endarto, and Bagus Teguh Santoso, "Legal Framework and Law Enforcement of Illegal Mining in Indonesia: A Normative Jurisdictional Analysis of the Implications of Environmental Law and Criminal Law," *West Science Law and Human Rights* 3, no. 02 (2025): 177–84, <https://doi.org/https://doi.org/10.58812/wslhr.v3i02.1865>.

normative systems that influence how communities conceptualize legality and justify their actions. For instance, while Asyari et al. pointed to the role of societal norms, their analysis did not engage with how these norms are embedded in deeper notions of legal consciousness and community values. Similarly, Hasibuan and Martanto focused on enforcement and customary authority without exploring how people internalize and legitimize their mining behavior in the face of state prohibition.

While these studies contribute valuable insights into the enforcement, policy, and socio-economic dimensions of illegal mining, they tend to remain within institutional or regulatory perspectives. What remains underexplored is how community-level legal consciousness, cultural norms, and localized notions of legitimacy influence persistent non-compliance with mining laws. Although Asyari briefly touched upon the role of societal norms, the analysis stopped short of interrogating how such norms are embedded in legal culture. Similarly, Hasibuan, Martanto, and Rahmawati emphasized enforcement and structural constraints but did not address how communities internalize, resist, or reinterpret legality in the context of PETI.

To better understand these patterns of legal resistance and adaptation, this study draws upon Lawrence M. Friedman's widely cited framework of the legal system, which consists of three core components: legal structure, legal substance, and legal culture. Legal structure refers to the institutional and organizational aspects of the legal system, including courts, law enforcement, and procedural mechanisms. Legal substance encompasses the rules, principles, and norms contained in laws, regulations, and judicial decisions. Legal culture, the central concept of this study, captures the beliefs, values, and attitudes held by individuals and communities about law—how they perceive it, respond to it, and

interact with it in practice.¹⁰ By applying this framework, the study investigates how Paningkaban's community values and socio-legal attitudes contribute to the normalization and persistence of illegal gold mining.

This study addresses a critical gap by integrating Lawrence M. Friedman's theory of legal culture with green criminology, shifting focus from institutional failure to the normative foundations of illegal mining. Centered on Paningkaban Village in Banyumas—recently the site of a fatal PETI incident—it offers a novel socio-legal perspective on PETI as a culturally embedded environmental crime. This framing is urgent amid ongoing ecological degradation and weak enforcement. The study highlights how legal non-compliance emerges not solely from poverty, but from deeply rooted survival norms, contributing to more culturally responsive, inclusive, and effective environmental governance strategies.

The urgency of this study is grounded in juridical, philosophical, and sociological foundations. Juridically, the practice of illegal gold mining (PETI) constitutes a direct violation of Article 158 of Law Number 3 of 2020 concerning Mineral and Coal Mining (UU Minerba), which explicitly mandates that all mining activities must operate under official permits and comply with environmental protection regulations.¹¹ However, the persistent inconsistency in law enforcement, particularly in regions such as Banyumas Regency, reflects a systemic gap between written legal norms and their actual implementation in the field.

Philosophically, the ongoing prevalence of PETI raises fundamental issues related to environmental justice and the ethical responsibility of the state to ensure ecological sustainability while protecting the rights of nature and vulnerable communities. This condition invites critical

¹⁰ Lawrence M Friedman, *The Legal System : A Social Science Perspective*, Russel Sage Foundation, vol. hlm. 17 (New York, 1975).

¹¹ Rohman, Hartiwiningsih, and Rustamaji, "Illegal Mining in Indonesia: Need for Robust Legislation and Enforcement."

reflection on the normative priorities of law—whether it serves environmental preservation, state authority, or the subsistence needs of marginalized communities.¹² Sociologically, PETI is deeply rooted in local livelihood strategies, customary values, and communal perceptions that often diverge from formal legal frameworks. A nuanced understanding of these social dynamics is essential for developing legal interventions that are responsive, inclusive, and culturally legitimate, beyond merely punitive or repressive approaches.

Building on this foundation, the study offers a socio-legal analysis of how the legal culture of the Paningkaban community contributes to the social legitimacy of PETI. While existing literature has discussed institutional enforcement gaps and socio-economic motivations, it has largely overlooked the internalized cultural narratives, communal moral reasoning, and local perceptions of legality that shape compliance behavior. This study fills that gap by examining how these normative dimensions of legal culture—how law is understood, justified, and practiced within the community—normalize and sustain environmentally harmful mining practices. By framing PETI as a socially accepted form of environmental crime, this study offers a deeper understanding of legal non-compliance. It explains why formal law often proves ineffective in altering behavior. Accordingly, the research addresses two central questions: How does Paningkaban's legal culture view illegal mining? And to what extent can PETI be understood as a green criminological issue of systemic non-compliance?

¹² David N Pellow, "Chapter 6: Environmental Justice," in *Handbook on Inequality and the Environment* (Cheltenham, UK: Edward Elgar Publishing, 2023), 71–85, <https://doi.org/10.4337/9781800881136.00014>.

Method

This research employs a qualitative socio-legal methodology to examine how legal culture contributes to the persistence and social legitimacy of illegal gold mining in Paningkaban Village, Banyumas Regency, Central Java. The study uses a micro-level case study approach, focusing on a rural community that has long been both economically dependent on and environmentally affected by PETI activities. The socio-legal perspective enables the analysis of how formal legal norms—particularly those derived from the Indonesian Mineral and Coal Law—interact with local social realities, community values, and informal practices. Paningkaban was selected as the case study site due to its long-standing and openly practiced PETI activities, its recent exposure to national attention following a fatal mining accident in 2023, and the unique coexistence of regulatory presence and community-based normalization of mining. These characteristics make it both a relevant and critical site for examining how legal culture influences environmental non-compliance in structurally marginalized rural contexts.

The research is conducted using a hermeneutic methodological approach, which views law as a crystallization of symbolic meanings embedded in social life.¹³ In this perspective, understanding community perceptions of PETI requires interpreting the signs, traditions, and cultural expressions that constitute their legal consciousness. Drawing from Satjipto Rahardjo's concept of searching for meaning, the study explores how PETI is not only seen as an economic activity but also as a deeply rooted social and cultural identity.¹⁴ Data were collected through a combination of in-depth interviews, participant observation, and literature research, which included academic works, policy documents, media reports, and local records. Key informants included miners and local government officials. Observational data were gathered from mining sites, public forums, and everyday village life. This interpretive framework, grounded in Friedman's

¹³ Suteki and Galang Taufani, *Metodologi Penelitian Hukum (Filsafat, Teori, Dan Praktik)* (Depok: Rajawali Press, 2018).

¹⁴ Satjipto Rahardjo, *Sosiologi Hukum Dalam Pembangunan Hukum Nasional* (Jakarta: Persahi, 1988).

theory of legal culture and supported by green criminology, provides insight into how local values and symbolic interactions shape non-compliance with environmental law in contexts of structural marginalization.

Result and Discussion

Paningkaban Village, located within Gumelar Subdistrict in Banyumas Regency, was specifically selected as the primary research site due to its central role in the dynamics of illegal gold mining activities (PETI). As one of the villages with the most intense PETI operations (for about 50 mining spots according to the Secretary of Koperasi Sumber Rezeki), Paningkaban reflects the structural, economic, and cultural conditions that define illegal mining practices across the Banyumas region. This village not only exemplifies the embedded nature of PETI in daily life but also mirrors the broader regional pattern, making it a suitable and representative case for studying illegal mining in Banyumas. The existence of community-based structures like Koperasi Sumber Rezeki—a cooperative involving hundreds of miners—further illustrates how PETI is normalized and systematized. These characteristics make Paningkaban a critical locus for understanding how socio-legal and cultural factors sustain informal mining economies, and why formal law often struggles to assert authority in such settings.

A. Legal Culture and the Normalization of PETI in Paningkaban Mining Communities

Illegal gold mining, or *Pertambangan Emas Tanpa Izin* (PETI), in Paningkaban Village has long transcended its legal classification as an illicit activity. Instead, it has become embedded in the cultural and economic routines of the community. Rather than being perceived as a violation of the law, according to the miner's community in Paningkaban, PETI is widely regarded as a legitimate means of earning a livelihood. This normalization is supported by empirical data and field observations

indicating that approximately 60–70% of the 5,554 villagers either directly participate in or benefit from mining operations. This estimate was derived from qualitative interviews with key informants—including Sukarmo, the Village Head of Paningkaban—and triangulated through field observations and informal discussions with community members during site visits.

The persistence of PETI as a communal norm stems from several interrelated factors. First, the community's economic dependence on mining is significant—earnings from PETI can reach IDR 20–50 million per month, according to the Chair of Koperasi Sumber Rezeki (a local cooperation that manages local miners in Gumelar Subdistrict Area, which is centralized in Paningkaban and Cihonje Village), despite the uncertainties and health risks associated with mercury use. Second, PETI is also justified through local cultural values that believed by the miners community such as *sadumuk bathuk sanyari bumi ditohi pati*, a Javanese philosophy that symbolizes unwavering defense of ancestral land and resources.¹⁵ This ideology reinforces the community's view that mining is not only permissible but also a moral obligation to uphold by society and territorial integrity. Similar cultural legitimizations of illegal mining have been observed in other Indonesian communities, where traditional beliefs and economic necessities intertwine to sustain such practices.¹⁶

Moreover, the social legitimacy of PETI is reinforced by strong communal acceptance and internal conflict resolution mechanisms that bypass formal legal channels. In Paningkaban, fatal mining accidents—such as the 2012 incident in which three miners died from oxygen deprivation—have been resolved not through legal prosecution, but by informal compensation arrangements negotiated within the community. This mirrors broader findings by Muslihudin et al., who note that local government responses to illegal mining in Banyumas have historically been ambivalent. While formally prohibited, PETI persists due to its perceived necessity and community reliance. Enforcement is often soft or symbolic,

¹⁵ Y B Cahya Widiyanto and Toshio Sugiman, "Developing a Community Revitalization Movement Based on Reflective Dialog Using Engaged Ethnography," *Journal of Group Dynamics* 32 (2015): 104–313.

¹⁶ Derita Prapti Rahayu et al., "Implications Of Illegal Community Mining For Economic Development In Bangka Regency, Indonesia," *Law Reform: Jurnal Pembaharuan Hukum* 19, no. 2 (2023): 270–93, <https://doi.org/10.14710/lr.v19i2.52866>.

constrained by the community's dependence on mining and the absence of viable alternatives.¹⁷ These informal justice practices not only undermine state legal authority but also illustrate how community-driven norms construct a parallel system of accountability rooted in tradition, economic survival, and mutual understanding.

Such informal mechanisms may offer greater accessibility and social legitimacy within rural communities. Still, when formal law fails to respond to lived realities, these systems can shift from complementing state law to replacing it altogether. This substitution challenges legal legitimacy and fragments state authority, particularly when informal institutions become the primary arbiters of justice.¹⁸ The case of Paningkaban reflects this broader phenomenon, where communal trust in informal processes further diminishes the perceived relevance of formal legal enforcement.

Despite the visible environmental degradation, including mercury pollution and altered landscapes, resistance to legal enforcement persists. Although one case related to illegal gold mining was finally brought to trial in 2025 (Case No. 40/Pid.Sus-LH/2025/PN Pwt), it marks the first instance of formal prosecution for gold-related PETI in the jurisdiction of the Purwokerto District Court in over a decade.¹⁹ This case is particularly noteworthy as it emerged only after the 2023 Pancurendang mining tragedy, and involves a location directly tied to that incident. Prior to this, no gold-related PETI cases had been prosecuted, as confirmed through interviews with Achmad Aris Mugiandono, a public prosecutor, and verified via the SIPP database of Pengadilan Negeri Purwokerto. From 2017 to 2024, all other mining-related prosecutions involved sand or soil excavation. This pattern reflects a systemic gap between law in the books and law in action, where the persistence of PETI highlights legal inaction, institutional hesitance, and community normalization of unlawful practices.

¹⁷ Muslihudin Muslihudin et al., "LOCAL GOVERNMENT'S ROLE AND POLICY ON ILLEGAL MINING (Case Study of Gold Mining in Banyumas Indonesia)" *American Journal of Humanities and Social Sciences Research*, no. 2 (2020): 275–82, www.ajhssr.com.

¹⁸ Tilmann J. Röder, "Informal Justice Systems : Challenges and Perspectives," *Innovations in Rule of Law* 58 (2013): 58–61.

¹⁹ Pengadilan Negeri Purwokerto, "Sistem Informasi Penelusuran Perkara Pengadilan Negeri Purwokerto," Mahkamah Agung Republik Indonesia, 2025.

The challenges in enforcing environmental laws against illegal mining are well-documented, underscoring the need for more robust and coordinated legal frameworks.²⁰ Although the 2025 case signals some progress, it also illustrates the reactive and exceptional nature of state enforcement. Thus, PETI in Paningkaban cannot merely be understood as criminal conduct; it must be viewed through the lens of legal culture, where socio-economic survival, communal values, and state retreat from enforcement intersect.²¹ As this study demonstrates, PETI constitutes a legally ambiguous, socially accepted practice that challenges the normative boundaries of formal criminal law and demands culturally informed, participatory, and non-penal legal strategies.

The local legal culture in Paningkaban does not reject the existence of law outright, but reinterprets its meaning based on lived socio-economic realities and culturally constructed values. In accordance with Lawrence Friedman's theory, legal culture in this village is shaped not only by formal legal norms but also by internalized social expectations, local traditions, and collective practices.²² Within the mining community, PETI is not viewed as a criminal offense, but as a socially justified activity rooted in moral obligation and ancestral rights.²³ For the Paningkaban miner's community, survival through mining is framed as legitimate—even honorable—especially when contrasted with the inaccessibility and complexity of state mining permits.

This understanding resonates with Satjipto Rahardjo's concept of searching for meaning, where law is understood not merely through written statutes but through lived experience and cultural interpretation²⁴. This perspective aligns with the symbolic interactionism of Herbert Blumer, in which human behavior is shaped by meanings that emerge through social interaction²⁵. In Paningkaban, this means PETI is symbolically encoded as

²⁰ Rohman, Hartiwiningsih, and Rustamaji, "Illegal Mining in Indonesia: Need for Robust Legislation and Enforcement."

²¹ Oleh Ika Darmika, "Budaya Hukum (Legal Culture) Dan Pengaruhnya," *Jurnal Hukum Tô-Râ* Vol. 2 No. (2016): 429–35.

²² Hasaziduhu Moho, "Penegakan Hukum Di Indonesia Menurut Aspek Kepastian Hukum, Keadilan, Dan Kemanfaatan," *Jurnal Warta Universitas Dharmawangsa* 13, no. 1 (2019): 138–49.

²³ Derita Prapti Rahayu, *Budaya Hukum Pancasila* (Yogyakarta: Penerbit Thafa Media, 2014).

²⁴ Rahardjo, *Sosiologi Hukum Dalam Pembangunan Hukum Nasional*.

²⁵ Rahayu, *Budaya Hukum Pancasila*.

a rightful livelihood, sustained by inherited knowledge, peer acceptance, and social rituals. The Javanese maxim *sadumuk bathuk sanyari bumi ditohi pati* (even a fingertip of land must be defended with one's life) exemplifies how ancestral land becomes a sacred resource whose exploitation for survival is not only tolerated but valorized.

Further enriched by Alfred Schutz's phenomenological lens, the legal meaning of PETI cannot be dissociated from the lifeworld of the community.²⁶ Individuals act upon norms shaped by subjective experiences, economic hardship, and intergenerational interaction. In Paningkaban, what outsiders may label as legal deviance is internally perceived as resilience and communal solidarity. Legal interventions—such as raids or arrests—are often seen not as restorations of justice but as disturbances to local order. This reflects a broader trend in Indonesia, where the legal culture still prioritizes punitive justice over reconciliation, limiting acceptance of state-imposed legal frameworks. Meanwhile, local norms emphasize community-based mechanisms, often relying on informal consensus and mutual aid.²⁷

In this legal ecosystem, formal institutions prioritize procedural certainty, while villagers prioritize social legitimacy and survival. The persistent tension between these two legal cultures underscores the urgent need to align environmental justice strategies with culturally embedded modes of dispute resolution and communal values. As Hilman Hadikusuma notes, such dissonance fuels selective compliance, where formal legality is overridden by socially embedded legitimacy.²⁸

These findings reveal that PETI in Paningkaban is not driven solely by weak enforcement or poverty, but by a deeply rooted legal culture that redefines legitimacy through local norms, traditions, and survival strategies. Law is interpreted not through state rules, but through communal experience and symbolic meaning, creating a normative order that often

²⁶ Rahayu.

²⁷ Adwi Mulyana Hadi, Anik Iftitah, and Syahrul Alamsyah, "Restorative Justice Through Strengthening Community Legal Culture in Indonesia: Challenges and Opportunity," *Mulawarman Law Review* 8, no. 1 (2023): 32–44, <https://doi.org/https://doi.org/10.30872/mulrev.v8i1.1140>.

²⁸ Hilman Hadikusuma, *Pengantar Antropologi Hukum* (Bandung: Citra Aditya Bakti, 2004).

contradicts formal legality. This dissonance challenges the effectiveness of environmental law and calls into question how the state addresses culturally embedded environmental harm.

B. Green Criminology and Systemic Non-Compliance in Paningkaban

Green criminology emerged in the early 1990s as a critical branch of criminological inquiry that broadened the traditional boundaries of crime. In this framework, crime is no longer understood merely as acts involving interpersonal or property offenses, but also includes harm inflicted upon the environment, ecological injustice, and the dynamics of power that enable environmental degradation. The term "green criminology" was first introduced by Michael J. Lynch in 1990, who proposed a harm-based approach, arguing that serious acts of environmental destruction—regardless of whether they are formally criminalized—should be viewed as violations of ecological and social justice.²⁹ This perspective critiques conventional criminology, which often confines its focus to actions formally defined as crimes by the state, while overlooking various harms facilitated by political and corporate actors.

In contemporary developments, harm-based approaches such as green criminology and zemiology have become increasingly important, particularly in the Anthropocene era, where human activities have become the dominant force altering the planet's ecological systems. The concept of the Anthropocene reveals that many forms of environmental degradation, such as climate change, deforestation, and water pollution, develop slowly and invisibly, making them difficult to capture through formal legal frameworks that only recognize crimes explicitly defined by legislation. As Rob Nixon explains, this phenomenon is referred to as "slow violence," meaning harm that unfolds gradually and is not always immediately visible,

²⁹ Michael J. Lynch, "Green Criminology and Environmental Crime: Criminology That Matters in the Age of Global Ecological Collapse," *Journal of White Collar and Corporate Crime* 1, no. 1 (2020): 50–61, <https://doi.org/10.1177/2631309x19876930>.

yet causes profound long-term damage.³⁰ Green criminology, as expanded by Rob White through the concept of "eco-justice," seeks to overcome these legalistic limitations by emphasizing the need to recognize forms of "harm without crime," that is, ecological and social damage that occurs even when not formally criminalized³¹.

Building on this foundation, green criminology also challenges anthropocentric and legalistic approaches to the definition of crime by emphasizing the need to protect ecosystems, non-human species, and vulnerable communities. It examines how global inequality, state policies, and corporate practices contribute to resource exploitation and ecological damage.^{32 33} Rather than focusing solely on violations codified in law, this approach highlights that much environmental harm occurs in legally ambiguous or underregulated spaces.

In the context of green criminology, the activity of PETI (Illegal Gold Mining) in Paningkaban clearly fulfills the definition of an environmental crime. Although the enforcement process against this activity has not been rigorously pursued within the formal legal system in Banyumas Regency, PETI has caused severe ecological damage, aligning with the main concerns of green criminology. The uncontrolled use of mercury in gold extraction, for instance, has led to widespread contamination of soil and river ecosystems, threatening biodiversity as well as public health. Recent research in the Cimande River, Paningkaban, detected mercury (Hg) levels ranging from 0.05489 mg/L to 12.3544 mg/L, far exceeding WHO's permissible limit (0.001 mg/L) and national standards (PP No. 82/2001 and Kepmen LH No. 2/1988).³⁴

³⁰ Asst Prof Hanan Abbas Hussein, "Ecocritical Analysis of Slow Violence and the Environmentalism of the Poor By Rob Nixon," *International Journal of Research in Social Sciences & Humanities* 12, no. 03 (2022): 10–20, <https://doi.org/10.37648/ijrssh.v12i03.002>.

³¹ Rob White, *Environmental Harm*, 1st ed. (Bristol University Press, 2013), <https://doi.org/10.2307/j.ctt9qgsq7>.

³² Daan van Uhm, "Green Criminology and Biodiversity Loss: Crimes and Harms against Flora and Fauna," in *Oxford Research Encyclopedia of Criminology and Criminal Justice* (Oxford University Press, 2024), <https://doi.org/10.1093/acrefore/9780190264079.013.763>.

³³ Angus Nurse, "Green Criminology: Shining a Critical Lens on Environmental Harm Comment," *Palgrave Communications* 3, no. 1 (2017): 1–3, <https://doi.org/10.1057/s41599-017-0007-2>.

³⁴ Saudin Yuniarno, Agnes Fitria Widiyanto, and Septiono Bangun Sugiharto, "Evaluation of Mercury (Hg) Control Analysis in Water Bodies near Traditional Gold Mines," *BKM Public Health & Community Medicine* 40, no. 9 (2024): 1–5, <https://doi.org/10.22146/bkm.v40i09.16231>.

These findings demonstrate that river water near PETI areas has suffered heavy contamination due to the uncontrolled use of mercury in traditional gold processing. This pollution not only endangers aquatic ecosystems but also increases health risks for surrounding communities through the accumulation of mercury in the food chain and human bodies. PETI activities also contribute to massive deforestation and soil destabilization, significantly increasing the risk of landslides—a phenomenon that has become increasingly common in the Gumelar region, as recorded by Banyumas Regency's Central Statistics Agency (BPS) in 2021, which noted 72 landslide incidents in Gumelar District, indirectly indicating the impact of PETI.³⁵

In comparative terms, similar global patterns have emerged in other green criminological case studies. For instance, illegal gold mining in the Amazon Basin led to a 90% increase in deforestation between 2017 and 2020, with activities encroaching upon Indigenous territories and causing widespread mercury contamination.³⁶ Likewise, in Ghana, artisanal and small-scale gold mining (ASGM) contributes to severe environmental degradation, including water and soil pollution, due to poor regulation and limited enforcement capacity, which highlights how cross-sectoral policy incoherence, especially between environmental, mining, and agricultural sectors, has perpetuated informal ASGM practices and hampered efforts toward sustainable governance.³⁷ Like PETI in Paningkaban, both cases illustrate how environmentally harmful practices are often driven by structural marginalization, legal ambiguity, and economic desperation. These global comparisons reinforce that PETI is not an isolated phenomenon, but part of a broader pattern that exemplifies the central analytical concerns of green criminology.

³⁵ Badan Pusat Statistik Kabupaten Banyumas, "Kecamatan Gumelar Dalam Angka 2021" (Purwokerto, 2021).

³⁶ Juliana Siqueira-Gay and Luis E. Sánchez, "El Estallido de La Minería Ilegal de Oro En La Amazonía Brasileña Impulsa La Deforestación," *Regional Environmental Change* 21, no. 2 (2021): 1–5.

³⁷ Enoch Adranyi, Lindsay C. Stringer, and Henrice Altink, "Artisanal and Small-Scale Gold Mining Governance and Cross-Sectoral Policy Coherence in Ghana," *Resources Policy* 96, no. July (2024): 105235, <https://doi.org/10.1016/j.resourpol.2024.105235>.

This broader pattern is also evident within Indonesia itself, where other regions facing similar socio-economic and regulatory challenges exhibit comparable dynamics. In Mount Botak, Maluku, and parts of Kalimantan, small-scale illegal mining practices reveal striking parallels with PETI in Paningkaban, particularly regarding the uncontrolled use of mercury, which has resulted in significant contamination of soil and water sources surrounding mining areas.^{38 39} Across these regions, miners frequently justify their involvement in PETI as a means of economic survival in the absence of formal employment and amidst persistent structural poverty. However, state responses have varied. In Mount Botak, enforcement has been sporadic and largely repressive, with forced evictions triggering social tensions and conflict.⁴⁰ Kalimantan has seen a more mixed approach, combining limited law enforcement with alternative livelihood programs aimed at reducing local dependence on mining.⁴¹ In contrast, Paningkaban experienced weak enforcement prior to the 2023 Pancurendang tragedy. Although authorities attempted to shut down mining operations following the incident, activity resumed within three months, revealing the tenuous nature of regulatory control. These domestic comparisons further affirm that PETI in Paningkaban is part of a wider socio-environmental trend within Indonesia, where illegal mining continues to flourish amid enforcement inconsistency, community dependence on extractive livelihoods, and fragmented natural resource governance.

Furthermore, global trends show that mining activities, including small-scale operations like PETI, have become one of the significant contributors to the loss of tropical primary forests, accelerating the

³⁸ Martanto and Nasihuddin, "Data-Based Policy as a Solution to Overcome Illegal Mining of Mount Botak, Buru Regency, Mollucas Province for Sustainable Development."

³⁹ Ongku Hasibuan, Jann Tjakraatmadja, and Yos Sunitiyoso, "Finding Workable and Mutually Beneficial Solutions to Eradicate Illegal Gold Mining," *BISNIS & BIROKRASI: Jurnal Ilmu Administrasi Dan Organisasi* 28, no. 2 (2021), <https://doi.org/10.20476/jbb.v28i2.1239>.

⁴⁰ Martanto and Nasihuddin, "Data-Based Policy as a Solution to Overcome Illegal Mining of Mount Botak, Buru Regency, Mollucas Province for Sustainable Development."

⁴¹ Hasibuan, Tjakraatmadja, and Sunitiyoso, "Finding Workable and Mutually Beneficial Solutions to Eradicate Illegal Gold Mining."

degradation of vital ecosystems.⁴² Data released by the World Resources Institute (WRI) indicate that between 2001 and 2020, the world lost nearly 1.4 million hectares of forest due to mining activities, including 450,000 hectares in tropical primary rainforests, with consequences not only for biodiversity loss but also for an increase of 36 million tons of CO₂e emissions annually⁴³. Unlicensed mining in forested areas like Paningkaban also reflects this global pattern, where ecological destruction occurs without adequate ecological restoration.

The persistence of PETI (illegal gold mining) in Paningkaban should not be understood merely as an isolated case of local disobedience, but rather as part of a systemic pattern of non-compliance rooted in structural governance failures. The continued existence of illegal mining activities reflects regulatory gaps and legal ambiguities within Indonesia's environmental and mining governance systems. Overlapping institutional mandates often exacerbate these gaps, unclear land tenure systems, and the limited presence of environmental monitoring agencies in rural areas.^{44 45} Furthermore, there is clear state ambivalence—where local and regional authorities sometimes tolerate or tacitly approve PETI due to its economic contributions to marginalized communities, even though it is prohibited under national law.

From the perspective of green criminology, it is important to understand the concept of "innocent offenders," referring to actors who do not perceive themselves as criminals but rather as victims of structural injustice. As discussed by Ayambire et al., small-scale mining actors often view their activities not as crimes but as a form of resistance against legal systems and policies they perceive as unjust. They act not with malicious intent, but out of urgent necessity to survive amid economic hardship, structural inequalities, and limited participation in decision-making processes. In this context, their actions reflect more of a defiance against

⁴² Radost Stanimirova et al., "Mining Is Increasingly Pushing into Critical Rainforests and Protected Areas," World Resources Institute, 2024.

⁴³ Stanimirova et al.

⁴⁴ Irsan Rahman et al., "Mineral and Coal Mining Regulatory Reform in Indonesia," *Journal of Law and Legal Reform* 6, no. 2 (2025): 1–68, <https://doi.org/https://doi.org/10.15294/jllr.v6i2.19040>.

⁴⁵ Rohman, Hartiwiningsih, and Rustamaji, "Illegal Mining in Indonesia: Need for Robust Legislation and Enforcement."

marginalization than pure criminality.⁴⁶ Miners in communities like PETI Paningkaban interpret their activities as rational adaptations to pressing conditions rather than deliberate legal violations. Thus, analyzing PETI requires focusing on understanding harm and structural injustice rather than simply blaming the offenders.

Conflicting priorities between ecological preservation and economic development further worsen this condition. The lack of consistent law enforcement, especially after environmental disasters, reveals a fragmented and reactive regulatory approach. PETI thus stands as a clear example of state-corporate environmental non-compliance, where weak oversight, minimal accountability, and the involvement of local elites or business actors foster ecological degradation.⁴⁷ In Indonesia, this reflects deeper systemic issues, where corruption remains widespread, particularly at the licensing stage, where mining permits are issued without proper environmental safeguards. Decentralization has intensified maladministration, with local elites exploiting regulatory gaps for personal gain. The KPK (Corruption Eradication Commission) reported that 60% of issued mining permits were problematic, showing how governance failures enable illegal mining and undermine long-term environmental protection efforts.⁴⁸

The case of illegal gold mining (PETI) in Paningkaban, when analyzed through the lens of zemiology—the study of harm—also reveals that environmental degradation represents only one dimension of the broader spectrum of harm produced. As Boukli and Kotsakis explain, zemiology exposes various forms of harm, including physical, financial, psychological, cultural/environmental, and transversal harm, namely the collective and enduring impacts of extractivism that damage ecological, social, and human

⁴⁶ Raphael Anammasiya Ayambire et al., “Constructing Alternative Interpretation: Embeddedness of Illegality in Small-Scale Mining,” *Extractive Industries and Society* 17, no. February (2024): 101430, <https://doi.org/10.1016/j.exis.2024.101430>.

⁴⁷ Hasibuan, Tjakraatmadja, and Sunitiyoso, “Illegal Gold Mining in Indonesia: Structure and Causes.”

⁴⁸ Hilaire Tegnan et al., “Mining Corruption and Environmental Degradation in Indonesia: Critical Legal Issues,” *Bestuur* 9, no. 2 (2021): 90–100, <https://doi.org/10.20961/bestuur.v9i2.55219>.

subjective orders.⁴⁹ Although PETI has acquired a degree of social legitimacy as a means of economic survival—evident in the solidarity among miners, the existence of a local mining cooperative (Koperasi Sumber Rezeki in Paningkaban), and patron-client patterns between financiers and laborers—there is no denying that the practice has caused significant harm across multiple aspects of the environment.

A sociological exploration of the rationality of the PETI mining community in Paningkaban reveals that their decisions are not purely individual, but rather shaped by strong social structures, such as cultural attachment to land, limited access to education, and the pressing need for economic survival. From Margaret Gilbert's perspective on collective intentionality, the actions of the miners can be understood as the result of unwritten social agreements, wherein the decision to continue mining is seen as a collectively rational path amidst structural constraints.⁵⁰ This collective rationality is also reflected in the community's pragmatic strategies, such as adapting to the clean water crisis by relying on water deliveries from the higher-altitude Lumbir District. Such practices exemplify rational collective action under constraint, namely collective actions born out of urgent conditions, which indirectly reinforce the social legitimacy of PETI activities as a means of survival within a vulnerable socio-economic ecosystem.

A clean water crisis for example, has become a tangible impact experienced by Paningkaban villagers, where most residents now rely on water supplies sent from the higher-altitude Lumbir District due to the deterioration of local groundwater quality caused by mining contamination. Future generations are set to inherit damaged ecosystems, polluted water sources, and a loss of biodiversity, undermining their right to a healthy environment, as highlighted through the zemiological perspective. Changes in the landscape, deforestation, soil erosion, and

⁴⁹ Avi Boukli and Andreas Kotsakis, "Transversal Harm and Zemiology: Reconsidering Green Criminology and Mineral Extractivism in Cerro de Pasco, Peru," *Critical Criminology* 31, no. 4 (2023): 1113–36, <https://doi.org/10.1007/s10612-023-09715-7>.

⁵⁰ Margaret Gilbert, *On Social Facts* (Princeton University Press, 1989), <https://doi.org/10.2307/j.ctv10vm20z>.

mercury pollution—as discussed by Muslihudin—further exacerbate environmental degradation in the Gumelar Subdistrict. Marginalized communities, who rely heavily on natural resources for their livelihoods, face increasing vulnerability as essential ecosystem services deteriorate. Thus, while PETI may fulfill short-term economic needs, it ultimately reinforces cycles of structural harm and ecological injustice.⁵¹

Conclusion

This study found that the traditional gold mining community in Paningkaban Village, Banyumas Regency, perceives illegal gold mining (PETI) not as a criminal act, but as a legitimate livelihood deeply rooted in cultural values, economic necessity, and collective rationality. The legal culture in Paningkaban Village, shaped by ancestral attachment to land and pragmatic survival strategies, further normalizes PETI practices while simultaneously weakening formal legal norms. Moreover, PETI in Paningkaban represents a systemic non-compliance issue within the framework of green criminology. Non-compliance is increasingly sustained by the complexity of licensing regulations, state ambivalence, economic marginalization, and the structural normalization of environmental harm. The complicated and often inaccessible legal procedures for obtaining mining permits discourage small-scale miners from pursuing formal compliance. Meanwhile, state authorities frequently exhibit inconsistent attitudes—at times tolerating PETI for its economic benefits to local communities, while at other times repressing it under public pressure. Economic marginalization exacerbates dependency on illegal mining as one of the few viable livelihood options.

⁵¹ Muslihudin et al., “LOCAL GOVERNMENT’S ROLE AND POLICY ON ILLEGAL MINING (Case Study of Gold Mining in Banyumas Indonesia).” *American Journal of Humanities and Social Sciences Research*, no. 2 (2020): 275–82. www.ajhssr.com

Therefore, addressing PETI requires culturally sensitive and participatory strategies beyond merely punitive enforcement. Future policies must integrate local legal consciousness, alternative livelihood programs, and community-based environmental restoration efforts to achieve sustainable compliance and environmental justice in rural mining areas. To implement such strategies, policy frameworks should incorporate legal pluralism by formally recognizing community-based norms and informal dispute resolution mechanisms that are already practiced in PETI-affected regions. Additionally, co-regulation models—where state actors collaborate with local cooperatives such as Koperasi Sumber Rezeki—can help harmonize enforcement with local economic realities. Community mediation forums should also be institutionalized to resolve conflicts and build consensus on sustainable environmental practices, ensuring that interventions are not only lawful but also locally legitimate.

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DECLARATION OF CONFLICTING INTERESTS

The authors declare that there is no conflict of interest regarding the research, authorship, and/or publication of this article.

FUNDING INFORMATION

None.

ACKNOWLEDGMENT

The authors would like to express their sincere appreciation to the Doctoral Program in Law at Diponegoro University for the academic environment and support that greatly enriched the research process. The authors also extend their gratitude to the Faculty of Law at Jenderal Soedirman University for continuous encouragement throughout the doctoral journey, which has been essential for the completion of this article. The institutional and academic support provided by both universities contributed significantly to the development and refinement of the ideas presented in this study.

HISTORY OF ARTICLE

Submitted : April 27, 2025

Revised : April 29, 2025

Accepted : May 21, 2025

Published : May 22, 2025

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