

Legal Risks of Conservation–Exploitation Imbalance in the Merangin UNESCO Global Geopark

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Abstract

This study aims to assess the legal risks arising from the conservation–exploitation imbalance in the governance of the Merangin UNESCO Global Geopark (UGGp), Indonesia, by examining how international, national, and regional legal frameworks regulate licensing, zoning, supervision, and institutional coordination. The study employs a normative-empirical legal research approach, combining statutory and conceptual analysis with field observations and interviews involving the Merangin Geopark Management Agency, local government, and community stakeholders. The findings demonstrate that the existing regulatory framework is formally complementary but remains institutionally fragmented and uneven in enforceability. In particular, vertical legal risks arise from the divergence between UNESCO’s conservation-oriented standards and national and regional regulatory frameworks that accommodate economic utilization, while horizontal legal risks emerge from overlapping authority in licensing, zoning, and supervision. Empirical manifestations include illegal mining encroachment, geosite vandalism, and weak inter-institutional coordination. This study’s novelty lies in conceptualizing geopark governance through a legal-risk perspective, showing that the main vulnerability is not the absence of regulations but the asymmetry among conservation standards, legal enforceability, and decision-making authority. The study further reveals an effectiveness gap in which the strongest conservation standard has the weakest domestic enforceability, while actors with binding licensing authority have comparatively limited conservation-oriented mandates. The study recommends integrating Geopark zoning data into national licensing systems, granting the Geopark Management Agency a binding co-decision role, establishing joint central–regional supervision, and adopting UNESCO’s conservation threshold as a substantive standard for permit evaluation. These measures are essential to strengthen regulatory coherence and secure sustainable Geopark governance while supporting local community welfare.

Keywords: Conservation; Exploitation; Legal Risk; Regulation Harmonization

1. INTRODUCTION

A Geopark is designated as a natural laboratory because it possesses natural diversity that must be protected as valuable heritage, integrating conservation, research, and sustainable development, with direct consequences for the welfare of the surrounding community and local economy a public asset that citizens expect their government to manage responsibly.¹ Indonesia currently has ten Geoparks recognized by UNESCO as Global Geoparks,² one of which is the Merangin Jambi Geopark, an area of approximately 4,832.31 km² spanning 12 sub-districts and 131 villages in Merangin Regency.³

¹ Syamsir et al., “Legal Aspects of State Asset Management: International Perspectives on Implementing State-Owned Property Law,” *Journal of Law and Legal Reform* 6, no. 2 (2025): 315–42, <https://doi.org/10.15294/jllr.v6i2.19296>.

² Kementerian Pariwisata dan Ekonomi Kreatif Republik Indonesia, “10 UNESCO Global Geopark Indonesia Yang Mendunia,” Kementerian Pariwisata dan Ekonomi Kreatif Republik Indonesia, 2024, <https://www.kemenparekraf.go.id/ragam-pariwisata/10-unesco-global-geopark-indonesia-yang-mendunia>.

³ Pemerintah Kabupaten Merangin, “Pemerintah Kabupaten Merangin,” *Admin*, 2017, 1, <https://meranginkab.go.id/profile/gambaran-umum>.

Merangin Geopark obtained UNESCO Global Geopark (UGGp) status through the 216th Session of the UNESCO Executive Board in Paris on 10–24 May 2023,⁴ following a struggle that began in 2012, was twice declared "not yet ready" at the national and Global Geopark Network (GGN) submission stages, and was finally validated after UNESCO's 2022 evaluation.⁵ This status was granted because Merangin simultaneously possesses geological diversity (geodiversity), biological diversity (biodiversity), and cultural diversity, with rock formations along the ancient Batang Merangin River dated to more than 300 million years old,⁶ *in-situ* plant fossils considered unique in the world, and an Exokarst-Endokarst landscape intersecting with the tectonic-volcanic system of Mount Masurai.⁷ These natural assets are inseparable from the area's cultural life, most notably the customary spatial system of the Serampas community for *Tanah Ulu Aek* in the Rantau Kemas Customary Forest, legally recognized since 2016,⁸ as well as the economic potential of coffee, tea, and creative culinary products developed by the surrounding community.⁹

The optimization of these three values cannot be separated from the concept of conservation, understood here as the present generation's utilization of the biosphere¹⁰ in a manner that preserves nature's potential for future generations.¹¹ In geopark management, conservation operates alongside utilization and promotional activities intended to establish Merangin as an internationally standard tourism destination, activities that are theoretically legitimate as geotourism-based economic utilization,¹² but which carry the latent risk of shifting into exploitation once conservation limits are exceeded. This is the structural dilemma at the heart of geopark governance: a Geopark is, on one hand, part of the Earth's heritage that must be protected, and on the other, an economic asset expected to generate tangible welfare for the local population.

This dilemma is not merely theoretical. Strengthened implementation of regulations and sanctions is urgently needed because existing legal instruments at the national, regional, and international levels have not fully prevented environmental disruption in Indonesian

⁴ Tim Peliput dan Penyusun Informasi Publikasi – Badan Penghubung Daerah Provinsi Jambi, "Geopark Merangin Resmi Masuk UNESCO Global Geopark," 2023.

⁵ Ida Bagus Oka Agastya et al., "Model Media Learning for Disaster Risk Reduction in the Batur UNESCO Global Geopark," *International Journal of Geoheritage and Parks* 12, no. 3 (2024): 353–66, <https://doi.org/10.1016/j.ijgeop.2024.04.005>.

⁶ Judith Nyulas et al., "Attractiveness Assessment Model for Evaluating an Area for a Potential Geopark—Case Study: Hațeg UNESCO Global Geopark (Romania)," *Land* 13, no. 2 (2024), <https://doi.org/10.3390/land13020148>.

⁷ Baca lebih lanjut terkait *Global Geopark Networks*, <https://www.unesco.org/en/igpp/geoparks/about>; <https://www.globalgeoparksnetwork.org/>.

⁸ Peraturan Daerah Kabupaten Merangin Nomor 8 Tahun 2016 tentang Pengakuan dan Perlindungan Masyarakat Hukum Adat Marga Serampas.

⁹ Arifin Heri Prasetyo, Nur Widiyanto, And Amiluhur Soeroso, "Pengembangan Geowisata Berbasis Partisipasi Masyarakat Di Kawasan Geopark Gunung Sewu Gunungkidul," *Ulil Albab : Jurnal Ilmiah Multidisiplin* 2, no. 7 (2023): 2749–63, <https://doi.org/10.56799/jim.v2i7.1716>.

¹⁰ *Biosphere* (biosfer) adalah lapisan bumi yang bisa ditinggali oleh makhluk hidup, mencakup seluruh makhluk hidup dan lingkungan tempat mereka tinggal.

¹¹ International Union for Conservation of Nature and Natural Resources (IUCN), "World Conservation Strategy: Living Resource Conservation for Sustainable Development," 1980.

¹² Leonard Felix Hutabarat, "Pengembangan Geopark Nasional Indonesia Menuju UNESCO Global Geopark Sebagai Diplomasi Geotourism Indonesia," *Jurnal Ilmiah Hubungan Internasional* 19, no. 1 (2023), <https://doi.org/10.26593/jihi.v19i1.6000.94-106>.

Geoparks.¹³ Three empirical indicators illustrate this legal vulnerability. First, at Ciletuh Geopark in Sukabumi, illegal gold mining persists despite being legally prohibited, producing sediment-laden runoff, river shallowing, and increased flood risk for surrounding communities.¹⁴ Second, within Merangin Geopark itself, an act of vandalism occurred at the Muara Karing Waterfall geosite, allegedly committed by student visitors, damaging fossil rock surfaces and littering the site a case that starkly illustrates the gap between the normative purpose of educational tourism and its practical outcome.¹⁵ Third, visitor complaints indicate that inter-site access, transportation, guiding services, and site mapping remain suboptimal, despite Merangin's obligation, as a UGGp, to function as a world-class tourism destination. These three empirical cases indicate that the risk of conservation-exploitation imbalance is not a hypothetical future concern, but a condition already materializing within the existing regulatory framework which raises the central legal question this research seeks to address: to what extent does the current hierarchy of international, national, and regional legal instruments governing geopark management actually operate to prevent, rather than merely formally prohibit, the shift from conservation-based utilization into unchecked exploitation, and where within that hierarchy do legal risks of disharmony most likely arise?

Research on Merangin Jambi Geopark has generally approached the area through the lens of tourism as a driver of economic growth, employment, and productive sectors,¹⁶ rather than through a legal-normative lens. To locate this research within the existing scholarly landscape, three representative prior studies are examined not merely for comparison, but to identify the analytical space each occupies and, by extension, the space this research is positioned to fill.

Hapsara and Ahmadi¹⁷ situate Merangin Geopark within destination-marketing scholarship, using a quantitative method to show that destination image and accessibility significantly influence visit decisions. This positions the geopark primarily as an object of tourism *attractiveness*, with governance and legal-environmental dimensions left outside the analytical frame. Utama et al. (2023) occupy an adjacent but distinct position, examining the role of higher education institutions and local communities in strengthening Geopark sustainability through a descriptive-narrative approach to education and empowerment programs¹⁸ a *social-institutional* position that likewise does not extend to an evaluation of the binding legal frameworks underlying such programs. Sukmono et al. (2022), meanwhile, occupy a *natural-science* position, using an exploratory method to document fish biodiversity along the Batang

¹³ Krzysztof Miśkiewicz, Anna Waśkowska, and Ewa Małgorzata Welc, *Documentation and Assessment of Geosites for Geotourism and Geoparks*, 2024.

¹⁴ Raniri Munawar, "Pengelolaan Geopark Untuk Mewujudkan Pariwisata Berkelanjutan (Studi Kasus Di Geopark Ciletuh-Palabuhanratu)," *Jurnal Bisnis, Manajemen & Ekonomi* 21 No 1, pp. 865-73, (2023), <https://doi.org/doi:10.33197/jbme>.

¹⁵ Dilansir dari laman resmi Geopark Merangin, bagian Artikel & Berita, <https://geopark.meranginkab.go.id/id/berita/detail/kutuk-aksi-vandalisme-gm-geopark-merangin-jambi-turun-bersihkan-sisasisa-coretan>, diakses 16 Maret 2025.

¹⁶ Osrita Hapsara and Ahmadi Ahmadi, "Analisis Keputusan Berkunjung Melalui Minat Berkunjung: Citra Destinasi Dan Aksesibilitas Pada Geopark Merangin Jambi," *Jurnal Manajemen Terapan Dan Keuangan* 11, no. 01 (2022): 64–76, <https://doi.org/10.22437/jmk.v11i01.14802>.

¹⁷ Hapsara and Ahmadi.

¹⁸ Wiki Utama et al., "Indonesia 3 Badan Pengelola UNESCO Global Geopark Merangin Jambi 5 Biologi," *Jl. Jenderal Sudirman* 7, no. 3 (2023): 3.

Merangin rafting route, contributing ecological data without connecting these findings to the legal or policy dimensions of ecosystem protection.¹⁹

Mapped together, these three studies form a cluster oriented toward the *utilization and social dimensions* of the Geopark marketing, education, and ecological documentation while leaving the *normative-legal dimension* of geopark governance unexamined. None analyzes how the multi-level legal architecture governing Merangin (UNESCO's international guidelines, national statutes and regulations, and regional regulation) interacts to either mitigate or generate legal risk when conservation and exploitation interests collide. This is precisely the analytical space this research occupies: rather than treating conservation and exploitation as a general policy tension, this study positions itself within environmental law and geopark governance scholarship, using legal risk analysis as its analytical instrument to evaluate the *hierarchy of norms* governing Merangin Geopark at the international, national, and local levels. In doing so, this research contributes to filling a gap not only in the specific literature on Merangin Geopark, but more broadly in Indonesian environmental law scholarship, where geoparks remain an under-theorized regulatory object compared to more established environmental law subjects such as forestry, mining, or protected-area conservation.

Table 1. Literature Review

Aspect	This Research	Hapsara Ahmadi	& Wiki Utama et al.	Sukmono et al.
Focus	Legal risks of conservation vs. exploitation	Interest and visit decisions	Role of Higher Education Institutions	Fish biodiversity (fauna)
Method	Normative qualitative	Quantitative	Narrative descriptive	Explorative
Strength	In-depth analysis of national-international legal + regulation review	Strong empirical statistical evidence	Actual community education activities and collaboration	Study of specific ecosystems, rare biological data
Weakness	No quantitative data	Does not address legal & environmental issues	No evaluation of institutional or long-term impacts	Does not analyze legal or policy aspects
Contribution	Recommendations for legal reform in geopark management	Strategies to increase tourism visits	Linking education & community empowerment	Revealing unique fauna adaptation & the impact of illegal mining (PETI)

Source: collection of comparative researches.

¹⁹ Tedjo Sukmono et al., "Berarung Jeram: Mengungkap Pesona Fauna Ikan Di Geopark Merangin Jambi," *Warta Iktiologi* 6, no. 2 (2022): 34–41.

Building on this positioning, this research is directed at anticipating the potential disharmony or conflict of interest between conservation activities²⁰ and exploitation activities (in this case, utilization and promotion) within Merangin Geopark, through an analysis of national regulations and international guidelines, to formulate policy or regulatory recommendations that secure the sustainability of Merangin's natural environment while supporting the local economy of Merangin Regency.

This study aims to assess the legal risks arising from the potential imbalance between conservation and exploitation in the governance of the Merangin UNESCO Global Geopark by examining the consistency and effectiveness of international, national, and regional legal frameworks. It further seeks to identify vertical and horizontal legal risks in licensing, zoning, supervision, and institutional coordination, and to formulate legal and institutional recommendations to strengthen regulatory harmonization and ensure the sustainable management of the Geopark while supporting local community welfare.

2. METHOD

This study employs a normative-empirical legal research method (*yuridis normatif-empiris*), which combines doctrinal analysis of legal norms with empirical field data to capture both the formal legal framework and its practical implementation in the management of Merangin Geopark.²¹ The normative dimension is conducted through a statute approach, by examining Presidential Regulation No. 9 of 2019, Ministerial Regulation No. 2 of 2020, Merangin Regency Regional Regulation No. 2 of 2018, and the Operational Guidelines for UNESCO Global Geoparks, and a conceptual approach, drawing on environmental law, sustainable development theory, and the Earth Jurisprudence concept, to interpret the legal relationship, hierarchy, and potential conflict of norms among these regulatory instruments. The legal materials analyzed in this study consist of: (1) primary legal materials, namely the laws and regulations listed above together with the UNESCO Operational Guidelines; (2) secondary legal materials, comprising academic journal articles, books, and prior research relevant to geopark governance; and (3) tertiary legal materials, including official publications of the Government of Indonesia and UNESCO used to support factual description.²² The empirical dimension was carried out through direct field observation and in-depth interviews with representatives of the Merangin Geopark Management Agency (BP Geopark), the local community, and the Merangin Regency Government, aimed at validating how the applicable legal norms are perceived and implemented in practice.²³ All data obtained from both the normative and empirical dimensions were analyzed descriptively-qualitatively using an interactive triangulation model (data reduction, data presentation, and data

²⁰ Zhenjie Jia, Fadong Wu, and Dujie Hou, "Geodiversity, Geotourism, Geoconservation, and Sustainable Development in Longyan Aspiring Geopark (China)," *Geoheritage* 15, no. 1 (2023), <https://doi.org/10.1007/s12371-022-00784-8>.

²¹ & Saldana Miles, Huberman, *Metodologi Penelitian Kualitatif*. In *Metodologi Penelitian Kualitatif*, Rake Sarasin, 2014.

²² Veronika Made Aprilia Kartika Dewi, I Wayan Sumandya, and Ni Made Ari Septiani, "Implementasi Model Pembelajaran Kooperatif Tipe Stad Untuk Meningkatkan Hasil Belajar Matematika Peserta Didik Kelas Xi," *Jurnal Pembelajaran Dan Pengembangan Matematika* 4, no. 2 (2024): 13–21, <https://doi.org/10.36733/pemantik.v4i2.9412>.

²³ Sidi Ahyar Wiraguna, "Metode Normatif Dan Empiris Dalam Penelitian Hukum : Studi Eksploratif Di Indonesia" 3, no. 3 (2024), <https://doi.org/10.59818/jps.v3i3.1390>.

verification/conclusion drawing). At the normative level, the interpretation of laws and regulations was conducted through systematic and teleological legal interpretation, used to identify the hierarchical relationship, complementarity, and potential legal risks arising from the interaction among international guidelines, national regulations, and local regulations governing geopark management.

3. RESULTS AND DISCUSSION

Currently, the regulations related to Geopark management in Indonesia are stipulated in the Presidential Regulation of the Republic of Indonesia Number 9 of 2019 on the Development of Geoparks and the Regulation of the Minister of Tourism and Creative Economy/Head of the Tourism and Creative Economy Agency of the Republic of Indonesia Number 2 of 2020 on Technical Guidelines for the Development of Geoparks as Tourism Destinations, which must serve as guidelines for the management and development of Geoparks by the Central Government, Regional Governments, and other stakeholders. The Jambi Provincial Government has also enacted regulations concerning Geopark management in the Merangin Regency Regional Regulation Number 2 of 2018 on the Protection and Management of Geoparks. As a Global Geopark, along with 212 other Global Geoparks from 48 countries, the Merangin Geopark also adheres to the Operational Guidelines for UNESCO Global Geoparks.

Based on the background described in the introduction, the Discussion section will begin with the existing conditions of the Merangin Geopark, followed by an explanation of regulations in the context of national and international law related to Geopark management, and conclude with a theoretical analysis from a legal perspective on the research topic.

3.1 Existing Conditions

Regarding concerns about excessive utilization leading to exploitation while neglecting the concept of conservation, this research takes mining activities within the Geopark area as an entry point to examine how governance arrangements manage this tension. Interestingly, Global Geopark status does not automatically designate the Merangin Geopark area as a conservation zone that entirely prohibits economic activities such as mining. This is also articulated in the basic principles of the UNESCO Global Geopark Network (GGN), which allow economic exploitation as long as it does not threaten the integrity of geological, ecological, and cultural values. This principle, however, places significant weight on the governance mechanism that determines where the line between permissible utilization and harmful exploitation lies — a determination that, as elaborated in Section 3.2, is where legal risk begins to emerge. The Merangin Geopark covers an area of approximately 4,832 km² with dozens of polygon points marking the locations of historical sites within the Geopark; the precision and legal status of these polygon points are themselves a governance instrument, since they form the basis on which permit applications are assessed as either compatible or incompatible with conservation zoning. Based on interviews conducted with the General Manager (GM) of the Merangin Geopark, representing the Management Agency (BP), Dr. Agus stated that, broadly speaking, the Merangin Geopark is divided into three main segments: the Jambi Flora Fossil Complex, the Masurai Caldera Complex, and the Karst Complex, each containing flagship icons that require differentiated protection regimes.

From the perspective of cultural diversity, the Merangin Geopark has three main sites. First, the Rumah Adat Kampung Tuo in Rantau Panjang Village, inhabited by the indigenous Batin Lamo community. The Rumah Tuo, more than 700 years old, has been preserved and passed down through generations to its 14th heir, and is protected by the Cultural Heritage Management Office under Law Number 11 of 2010 concerning Cultural Heritage — placing it under a distinct legal protection regime from the geological and biological assets discussed below, a point of relevance when assessing whether existing sectoral regulations adequately cover all three pillars of Merangin's diversity. Second, the Batu Batulih Inscription in Karang Berahi Village, believed to be a relic of the Srivijaya Kingdom dating to 680 AD, contains 16 points of Palawa script. Third, the Pratintuo Cylindrical Stone Inscription, a megalithic-era carved stone. None of these three cultural sites currently falls under a geopark-specific protective instrument beyond the general cultural heritage regime, which raises a governance question addressed further in Section 3.2 concerning the adequacy of cross-sectoral legal coordination.

From a geodiversity perspective, the Araucarioksilon Fossil represents a flagship geosite of the Merangin UNESCO Global Geopark. Located along the banks of the ancient Batang Merangin River, this in-situ fossilized Araucaria tree dates to the Early Permian period, approximately 300 million years ago, and predates the formation of Sumatra. Its accessibility through rafting-based tourism places the fossil in direct contact with visitors, thereby transforming the conservation–utilization trade-off into a tangible governance challenge involving physical preservation, tourism access, and local economic interests. The distinctiveness of the Merangin Geopark lies not merely in the coexistence of geological, biological, and cultural diversity, but also in their spatial and functional interdependence. Individual sites may simultaneously embody multiple dimensions of geodiversity and cultural value—for example, an inscribed stone situated within a coffee plantation—thereby bringing the same geographical space within the scope of multiple, potentially overlapping, regulatory regimes. This spatial interdependence creates a complex governance context in which conservation objectives, land-use practices, tourism development, and economic utilization must be reconciled across different levels and sectors of regulation.²⁴

Based on the information obtained, the Merangin Geopark Management Agency (BP Geopark) carries three main functions: conservation, education, and community empowerment, executed through synergy with multiple stakeholders. In practice, however, this synergy also reflects a fragmented governance structure: the conservation function for Nature Reserves, Protected Forests, National Parks, and Customary Forests is undertaken separately by the Natural Resources Conservation Agency (BKSDA), the Merangin Regency Environmental Agency (DLH), and the Provincial Forestry Office, while education is delegated to academic institutions and community empowerment to BP Geopark itself. This distribution of authority across multiple agencies with no single legally binding coordination mechanism is precisely the kind of institutional arrangement that, as discussed in Section 3.2, creates the potential for horizontal legal risk between national and local regulatory actors.

²⁴ Norzaini Azman et al., “Public Education in Heritage Conservation for Geopark Community,” *Procedia - Social and Behavioral Sciences* 7, no. 2 (2010): 504–11, <https://doi.org/10.1016/j.sbspro.2010.10.068>.

As a concrete outcome of this coordination, BP Geopark won the Best Good Practice award globally in 2023 for a program empowering indigenous communities in customary forest management, including river and spring preservation supported by micro-hydro power. Dr. Agus stated that funding for these activities was sourced from the National and Regional Budgets, self-managed funds, and grants — a multi-source funding structure whose accountability and long-term legal sustainability remain outside the scope of any single geopark-specific regulation, again underscoring the governance gap addressed in the following section.

The Rafting Enthusiast Group is a further form of community-based economic empowerment, operating a certified four-stop, 13-km route along the Batang Merangin River that passes directly through geologically and biologically sensitive zones, including the Araucarioksilon Fossil site. Because this tourism activity operates at the interface between economic utilization and the protection of a scientifically irreplaceable fossil resource, it exemplifies the conservation-exploitation dilemma that is the central concern of this research, and sets up the legal-normative analysis presented in Section 3.2.

3.2 Legal Perspective

Despite all the uniqueness and potential possessed by the Merangin Geopark, Dr. Agus stated that mining activities within the Geopark area are permitted as long as specific permits are obtained in accordance with Law Number 11 of 2020 on Job Creation, which partially amends and repeals certain articles in Law Number 26 of 2007 on Spatial Planning, as well as Government Regulation Number 21 of 2021. Any company wishing to conduct mining activities must submit a permit application to the Central Government, represented by the Ministry of Energy and Mineral Resources (ESDM), as stipulated in Law Number 3 of 2020 on Mineral and Coal Mining, which states that mining products, including gold and coal, fall under the authority of the Central Government. Of course, any mining activities must comply with Law Number 3 of 2020, Minister of ESDM Regulation Number 16 of 2021, Law Number 11 of 2020, Law Number 26 of 2007, Government Regulation Number 21 of 2021, Government Regulation Number 96 of 2021, and the Spatial Planning (RTRW) of the Province and Regency. Permit applications submitted to the central government are then discussed between the central government and the Geopark Management Agency. If the mining activities, according to spatial planning, do not fall within conservation areas or protected zones as indicated by polygon points, mining may proceed. However, UNESCO will still record such activities as a potential threat to the Geopark.

So far, the majority of permits have been granted for underground mining, a type of mining conducted below the surface, ensuring that the protection of historical sites remains controlled and that the environmental integrity around these sites is not damaged. If violations occur against the applicable legal framework, the legal risks include lawsuits challenging administrative permits by national legal institutions, warnings or potential revocation of the Global Geopark status by UNESCO, and criminal sanctions in accordance with Law Number 32 of 2009 on Environmental Protection and Management (PPLH). These various regulations, paradoxically, create opportunities for disharmony between conservation and exploitation in the Merangin Geopark. Special attention must be given to each mining permit and its

compliance with spatial planning, as conservation areas are considered "vulnerable." Not only mining activities but also the utilization of forest areas carry the potential risk of exploitation, such as deforestation.

When evaluated for its effectiveness, this regulatory framework is normatively adequate but institutionally fragile in practice. The requirement that mining permits be reviewed against spatial planning (RTRW) and polygon-based conservation zoning functions well as a preventive instrument on paper; however, its effectiveness ultimately depends on the accuracy and periodic updating of polygon data, as well as the willingness of the central government to reject permit applications that are formally compliant with spatial planning yet still threaten geological, ecological, or cultural integrity a standard narrower than UNESCO's conservation criteria. In other words, a mining permit may be entirely lawful under national mining and spatial planning law while still constituting the kind of exploitation UNESCO would regard as a threat to Geopark status. This gap between formal-procedural legality and substantive conservation adequacy is precisely where the legal risk of disharmony between conservation and exploitation originates.

One case that heightens concern is the Industrial Forest Concession Rights granted to companies to manage forests surrounding the Simering and Sengayau Cave sites. These rights allow companies to manage production forest areas, including timber harvesting to meet the needs of the wood industry. However, the forests around these sites are part of the Kerinci Seblat National Park (TKNS). Additionally, there are nature reserves, such as the karst conservation area at Tiangko Cave. Government-issued permits can be seen as a form of centralization that often lacks local ecological knowledge. In contrast, if such permits were granted to local communities who live in close interaction with the forest, they would naturally have a better understanding of and connection to the forest. Nonetheless, regular supervision by the Merangin Geopark conservation team remains necessary

The coordination of authority between the central and regional governments further compounds this risk. Mining and forestry permits, licensed under Law No. 3 of 2020 and the forestry regime governing the Kerinci Seblat National Park, remain centralized authorities of the Ministry of Energy and Mineral Resources and the Ministry of Environment and Forestry, while the Merangin Regency Government and BP Geopark the actors with the most direct knowledge of geopark zoning and local ecological conditions function only as parties to be "discussed with," rather than as parties holding co-decision or veto authority in the permit process. This asymmetry indicates that the coordination mandated by Presidential Regulation No. 9 of 2019 has not yet been translated into a binding joint-decision mechanism; it remains largely consultative. As a result, central government permit decisions can be issued without adequate integration with the more spatially and ecologically specific data held by BP Geopark and Merangin Regency Regional Regulation No. 2 of 2018.

Furthermore, this research will describe how the legislation regarding geopark management from sectoral and national to international levels views the potential disharmony between conservation and exploitation in the Merangin Geopark. Building on this evaluation, several operational measures are recommended to strengthen the balance between conservation and exploitation in Merangin Geopark: first, integrating BP Geopark's polygon and zoning data

directly into the national mining and forestry permit information system, so that spatial review uses the most current geopark boundary data rather than static RTRW maps; second, granting BP Geopark formal co-decision authority — rather than merely consultative status — in reviewing permit applications located within or adjacent to Geopark polygons; third, establishing a joint central-regional supervisory team involving ESDM, the Ministry of Environment and Forestry, the Merangin Regency Government, and BP Geopark to conduct periodic, joint field monitoring of active mining and forestry concessions; and fourth, adopting UNESCO's conservation threshold, rather than the narrower national spatial-planning threshold, as the binding standard for permit evaluation within Geopark polygons, so that a permit's formal legality under national law does not by itself guarantee its compatibility with UGGp conservation requirements.

The foregoing analysis indicates that the principal legal vulnerability of Merangin Geopark does not arise from the absence of regulatory instruments, but from the fragmentation of regulatory authority, conservation standards, and institutional responsibilities across different governance levels. The spatial interdependence of geological, biological, cultural, and economic resources means that a single activity may simultaneously trigger multiple legal interests and regulatory mandates, while the absence of a legally binding coordination mechanism may allow sectoral decisions to be made without fully incorporating the conservation objectives of the Geopark. Consequently, formal compliance with sector-specific licensing requirements cannot necessarily be equated with substantive compliance with the conservation objectives attached to UNESCO Global Geopark status. This condition creates a structural legal-risk gap between authorization and conservation, particularly where economic utilization is legally permissible but may compromise the integrity of geosites or associated cultural and biological assets. The analysis therefore suggests that effective Geopark governance requires not merely regulatory harmonization, but also institutional mechanisms capable of integrating conservation thresholds into licensing, zoning, monitoring, and enforcement decisions. In this context, the legal effectiveness of the Merangin Geopark framework should be assessed not only by the existence and hierarchy of applicable norms, but by their capacity to prevent legally authorized activities from producing substantively incompatible conservation outcomes.

3.2.1 Presidential Regulation of the Republic of Indonesia Number 9 of 2019 on the Development of Geoparks

The enactment of Presidential Regulation (Perpres) Number 9 of 2019 represents a significant milestone in the development of national law concerning geopark management in Indonesia. This regulation marks the state's recognition of geoparks not merely as tourism assets, but as national strategic areas that integrate environmental conservation, public education, and local economic empowerment. The Perpres explicitly establishes a cross-ministerial and institutional coordination framework, coordinated by the Coordinating Ministry for Maritime Affairs and Investment. This means that geopark management cannot operate in a sectoral or partial manner but must be holistic, involving local governments, the Ministry of Energy and Mineral Resources (ESDM), the Ministry of Environment and Forestry (LHK), the Ministry of Education, and the Ministry of Tourism and Creative Economy (Parekraf).

The regulation demonstrates that geoparks are not only about nature tourism but also form part of the national sustainable development strategy. The articles within this Perpres emphasize the importance of: (a) preparing a national action plan for geopark development; (b) preserving geological sites (geoheritage) as the basis for UNESCO Global Geopark (UGGp) status applications; and (c) enhancing the capacity of local communities to become active participants in geopark management. Normatively, Perpres No. 9 of 2019 strengthens the legal legitimacy of Merangin Geopark's management, which has been recognized as part of the UGGp network. However, the regulation also carries legal consequences: if implementation results in imbalances between conservation and exploitation (for example, due to uncontrolled mass tourism or excessive commercialization), it may pose legal risks, including the potential revocation of UGGp status by UNESCO or violations of national regulations on conservation and environmental protection.

In the context of Merangin Geopark, this Perpres serves as a strategic benchmark to assess the extent to which local policies and management actors can maintain a balance between geological preservation and economic utilization. The legal risks involved are not limited to administrative sanctions but also include potential lawsuits for environmental damage, conflicts of interest in land use, and failure to meet internationally agreed standards. Thus, Perpres No. 9 of 2019 serves not only as a legal framework for development but also as a measure of legal accountability in geopark management in the era of sustainable development.

Evaluated for its effectiveness, however, Perpres No. 9 of 2019 functions more as a coordination framework than an enforcement instrument. It mandates cross-ministerial coordination but does not assign a lead authority with binding decision power over conflicting sectoral permits, nor does it specify concrete sanctions for non-compliance. Consequently, its capacity to actually preserve the conservation–exploitation balance depends heavily on the goodwill of coordinated ministries rather than on enforceable legal obligation — a structural weakness that becomes more visible when this Perpres is read alongside the sector-specific mining and forestry regimes discussed above.

3.2.2 Regulation of the Minister of Tourism and Creative Economy/Head of the Tourism and Creative Economy Agency of the Republic of Indonesia Number 2 of 2020 on Technical Guidelines for Geopark Development as a Tourism Destination

The Regulation of the Minister of Tourism and Creative Economy (Permenparekraf) Number 2 of 2020 serves as an essential national technical reference outlining how geoparks are to be developed²⁵ as sustainable tourism destinations. Although primarily operational and technical, this regulation incorporates legal principles and policies aligned with the objectives of Sustainable Development Goals (SDGs),^{26, 27} while also reinforcing the legal framework

²⁵ Yongmun Jeon, Jung Goon Koh, and Darren Southcott, "A Case Study of Geopark Activation through Geobranding and Geotrails at the Jeju Island UNESCO Global Geopark, Republic of Korea," *Episodes* 46, no. 2 (2023): 211–27, <https://doi.org/10.18814/epiiugs/2022/022024>.

²⁶ Luchman Hakim et al., "Coffee Landscape of Banyuwangi Geopark: Ecology, Conservation, and Sustainable Tourism Development," *Journal of Tropical Life Science* 12, no. 1 (2022), <https://doi.org/10.11594/jtls.12.01.11>.

²⁷ Dewa Krisna Prasada Ni Putu Pramudia Anjaswari, Kadek Julia Mahadewi and Dewa Ayu Putri Sukadana, "Tinjauan Yuridis Penerapan Partisipasi Masyarakat Adat Dalam Pengelolaan Pandawa Watersport Di Tanjung Benoa Perspektif Hukum Pariwisata," *Al-Zain : Urnal Ilmu Sosial & Hukum* 3, no. 3026–2917 (2025): 6115–23, <https://doi.org/10.61104/alz.v3i5.2236>.

established by Presidential Regulation Number 9 of 2019. The regulation emphasizes that geopark development must not focus solely on economic or tourism aspects but must be based on three main pillars: (a) the conservation of geological heritage and biodiversity; (b) education and the enhancement of public awareness; and (c) local economic empowerment through sustainable tourism activities. Normatively, this regulation provides boundaries and guidance to ensure that tourism exploitation within geoparks does not exceed conservation limits. This is particularly relevant as a legal instrument to assess and manage potential legal risks arising from imbalances between conservation and exploitation in geopark management²⁸ including Merangin Geopark.

In an academic context, this regulation demonstrates that the approach to geoparks as tourism objects must be based on long-term, legally grounded management practices that avoid short-term exploitation. If these principles are neglected, the potential legal risks include violations of conservation norms, environmental degradation, and even the possible loss of global geopark status from UNESCO due to non-compliance with geopark governance principles. Functionally, this regulation can be seen as a preventive mechanism within environmental administrative law and tourism governance, making it highly relevant for developing an integrated legal policy model to ensure the sustainability of Merangin Geopark.

In terms of effectiveness, Permenparekraf No. 2 of 2020 is technically detailed but hierarchically weak: as a ministerial regulation, it cannot override sector-specific statutes such as the Mineral and Coal Mining Law or the Job Creation Law when these permit economic activities within Geopark polygons. Its three pillars therefore operate as *guidance* for tourism development, not as a binding limit on activities licensed under other sectoral regimes meaning its influence on preventing exploitation is largely confined to the tourism sector itself, while mining and forestry permits continue to be governed by stronger, and more economically permissive, statutes.

3.2.3 Regional Regulation of Merangin Regency Number 2 of 2018 on the Protection and Management of Geoparks

The Regional Regulation (Perda) of Merangin Regency Number 2 of 2018 represents a progressive step by the local government in demonstrating its commitment to the sustainable conservation and utilization of geological areas²⁹ through a local legal framework. This regulation serves as the first region-specific normative foundation in Indonesia that comprehensively governs the protection and management of geoparks within a regency. The regulation explicitly states its objectives as follows: (a) to protect Merangin's geological heritage (geoheritage) as a scientific, educational, and cultural asset; (b) to develop geopark areas as tourism destinations based on conservation and education; and (c) to enhance the welfare of local communities through sustainable economic empowerment.

This regional regulation holds significant juridical importance as it provides the local government with direct legal authority to manage the governance of Merangin Geopark, while

²⁸ Ettore Valente et al., "Geotourism in the Cilento, Vallo Di Diano and Alburni UNESCO Global Geopark (Southern Italy): The Middle Bussento Karst System," *Resources* 9, no. 5 (2020), <https://doi.org/10.3390/RESOURCES9050052>.

²⁹ Jeon, Koh, and Southcott, "A Case Study of Geopark Activation through Geobranding and Geotrails at the Jeju Island UNESCO Global Geopark, Republic of Korea."

ensuring that utilization activities do not conflict with environmental conservation principles. A distinctive feature of this regulation is its integrative approach, combining aspects of geological protection,³⁰ public education, tourism, and community empowerment, as stipulated in the following articles: Articles 4–7 establish the fundamental principles of geopark management, namely conservation, education, and community-based economic development, demonstrating that the regulation locally adopts the UNESCO Global Geopark framework; Articles 10–15 emphasize the obligation of all community members to preserve the geopark, including prohibitions and regulations on its utilization, serving as a legal control mechanism over exploration and physical development activities within the geopark area; and Articles 17–19 highlight the importance of community participation and the responsibility of business actors, while providing space for public reporting and subsequent evaluation.

From the perspective of regional administrative law, this regional regulation demonstrates a concrete form of decentralization of authority over environmental management and tourism. It functions not only as a product of local legislation but also as an instrument for oversight and control against potential excessive exploitation. In the context of Merangin Geopark, which now holds UNESCO Global Geopark status, this regulation serves as a crucial bridge to harmonize international standards with local legal implementation. Furthermore, it strengthens the academic argument that any imbalance between conservation and exploitation not only poses environmental risks but also has implications for the enforcement of local legal sanctions and the potential decline of Merangin Geopark's global legitimacy.

Assessed against the authority structure of national mining and forestry permits described earlier, this regional regulation reveals a significant asymmetry of coordination between the central and regional governments. Perda No. 2 of 2018 grants Merangin Regency direct legal authority over zoning, community participation, and business-actor obligations within Geopark boundaries, yet mining and forestry permits for the activities most likely to conflict with those zoning provisions remain centrally licensed by the Ministry of Energy and Mineral Resources and the Ministry of Environment and Forestry, with the regional government and BP Geopark positioned only as parties to be consulted, not as co-decision authorities. This means the actor with the most detailed spatial and ecological knowledge of the Geopark holds the weakest formal position in the permit-issuing chain, while the actor with permit-issuing authority sits furthest from the on-the-ground conservation data. Strengthening this regulation's effectiveness would require elevating BP Geopark's and the Regency Government's role from consultative to binding co-decision status in permit reviews affecting Geopark polygons.

3.2.4 Operational Guidelines for UNESCO Global Geoparks

The Operational Guidelines for UNESCO Global Geoparks is an official document established by UNESCO as an international framework to regulate the establishment, management, and evaluation of geoparks recognized within the UNESCO Global Geoparks (UGGp) network. These guidelines emphasize that a geopark is not merely a geological conservation area, but

³⁰ Luigi Perotti et al., "Fieldtrips and Virtual Tours as Geotourism Resources: Examples from the Sesia Val Grande UNESCO Global Geopark (NW Italy)," *Resources* 9, no. 6 (2020), <https://doi.org/10.3390/RESOURCES9060063>.

also a model for community-based management³¹ and sustainable development.³² Broadly, the guidelines cover the following aspects: a) the conservation of geological heritage as the core identity of a geopark; b) education and scientific research as key functions to enhance public awareness of the Earth and geological processes; and c) local economic development, particularly through the promotion of sustainable tourism that does not compromise environmental integrity.

One of the essential principles of these guidelines is that a geopark must have a legal, effective, participatory management structure with full authority over its territory.³³ The guidelines also mandate periodic evaluations every four years (revalidation), where failure to maintain a balance between conservation and exploitation may result in the revocation of UGGp status. In the context of Merangin Geopark, consistent implementation of these guidelines is critically important, as any sign of excessive exploitation or environmental degradation could provide UNESCO with strong justification to revoke its global geopark status, as has occurred in other countries.

From an effectiveness standpoint, the Operational Guidelines function as the strictest normative standard among the four instruments, yet paradoxically the weakest in domestic enforceability UNESCO's authority is limited to reputational sanction (status revocation) rather than legal sanction enforceable under Indonesian law. This creates an effectiveness gap: the instrument with the highest conservation standard has the least direct power to compel compliance at the operational level, where actual permit decisions are made by national and regional authorities under the weaker standards discussed above.

After examining the perspectives of national regulations and international guidelines concerning geopark management, this study proceeds to analyze these regulations through the lens of Environmental Law and Sustainable Development Theory³⁴ as well as the Earth Jurisprudence Concept. Sustainable development serves as the foundational concept underpinning national regulations and international guidelines, acting as a policy framework for current environmental conditions.³⁵ This theory emphasizes principles of sustainability, including intergenerational justice and the precautionary principle.³⁶ The state is regarded as a subject obliged to protect ecosystems through a robust legal framework. This aligns with the application of regulations concerning geoparks, which must adhere to the principles outlined in UNESCO's international guidelines. Moreover, the implementation and enforcement of

³¹ Khoiron Khoiron, Dewi Rokhmah, and Erdi Istiaji, "Sosialisasi Partisipasi Masyarakat Dalam Konservasi Lingkungan Ijen Geopark Wilayah Kabupaten Bondowoso," *Madaniya* 3, no. 1 (2022), <https://doi.org/10.53696/27214834.149>.

³² Kejian Xu and Wenhui Wu, "Geoparks and Geotourism in China: A Sustainable Approach to Geoheritage Conservation and Local Development—A Review," *Land* 11, no. 9 (2022), <https://doi.org/10.3390/land11091493>.

³³ I. Ketut Mastika et al., "Creative Strategies of Local Resources in Managing Geotourism in the Ijen Geopark Bondowoso, East Java, Indonesia," *International Journal of Geoheritage and Parks* 11, no. 1 (2023): 149–68, <https://doi.org/10.1016/j.ijgeop.2023.01.002>.

³⁴ Philippe Sands et al., *Principles of International Environmental Law, Fourth Edition, Principles of International Environmental Law, Fourth Edition*, 2018, <https://doi.org/10.1017/9781108355728>.

³⁵ Lavanya; jacqueline peel Rajamani, *International Environmental Law, Etika Jurnalisme Pada Koran Kuning : Sebuah Studi Mengenai Koran Lampu Hijau*, vol. 16, 2015.

³⁶ Sands et al., *Princ. Int. Environ. Law, Fourth Ed.*

these regulations must go beyond formal-procedural compliance and aim to deliver tangible justice and benefits in practice.

In the case of geoparks, legal justice does not merely signify the existence of valid exploitation permits, but also whether such permits are ecologically and socially just. The Earth Jurisprudence³⁷ views the legal system created by humans as a subject within the broader order of nature. This concept seeks to balance the rights derived from applicable regulations, such as the economic utilization of geopark areas, with the responsibility to preserve the earth and its ecosystems. In doing so, it fosters a mutual relationship between human well-being and the well-being of nature itself. This concept provides this study with a framework to propose effective legal solutions to human actions impacting the environment. The following table presents a comparative analysis of national regulations and international guidelines on geopark management, aimed at assisting readers in understanding the similarities and differences across multiple regulatory levels.

Table 2. Regulatory Analysis Aspects

Aspect of Analysis	Operational Guidelines for UNESCO Global Geoparks	Presidential Regulation No. 9/2019	Ministerial Regulation No. 2/2020	Merangin Regency Regulation No. 2/2018
Legal Status	International standard	Presidential Regulation	Ministerial Regulation	Regional Regulation
Scope	Global – applies to all UGGp members	National – coordination of geopark development	Sectoral – sustainable tourism development	Local – management of geopark in Merangin Regency
Main Focus	Conservation, education, and local economic empowerment	Cross-sectoral coordination and institutional strengthening	Integration of conservation into sustainable tourism	Zoning, community participation, protection of geological heritage
Conservation Principle	Fundamental principle, mandatory	Recognized as an essential element	Required for destination sustainability	Core basis for zoning and area protection
Approach	Utilization allowed only if not disturbing conservation	Supported for sustainable development	Prioritized within the framework of sustainable tourism	Strictly regulated through zoning restrictions
Sanctions for Violation	Revocation of UGGp status by	Not explicitly regulated	No direct sanctions	Administrative sanctions for zoning/conservation

³⁷ Rajamani, *International Environmental Law*.

	UNESCO			violations
Legal Risk	Removal from UNESCO Geopark Network	Weak inter-ministerial coordination	Potential over-exploitation of tourism without strong conservation control	Land-use conflicts, on-site conservation violations
Strength	Strict and measurable international standards	Encourages national coordination and action plans	Practical technical guidelines for tourism development	Direct supervisory instrument at the local level
Weakness	No binding national legal force	Less operational and lacks sanctions	Weak binding effect	Weakness in implementation and monitoring

Source: Legislation

Based on Table 2 Regulatory Analysis Aspects, in the context of Merangin Geopark as part of the UNESCO Global Geoparks,³⁸ the analysis of the four regulations above demonstrates the existence of a hierarchy of norms and responsibilities that are complementary in nature, yet not necessarily fully harmonious in their implementation. For instance, there is a potential for vertical legal risks between UNESCO's international regulations and national or local regulations, where UNESCO places stronger emphasis on conservation, while national and local regulations tend to lean more toward economic development. Horizontal imbalances may also occur, such as between national and local regulations regarding licensing and supervision of conservation zones.³⁹ The dilemma of interest once again emerges in the tension between international, national, and local regulations.

Taken together, this evaluation shows that the four instruments are not merely complementary in a static, hierarchical sense, but are also uneven in enforceability: the strongest conservation standard (UNESCO's Guidelines) carries the weakest domestic legal force, while the strongest domestic legal force (sectoral mining and forestry statutes) carries the weakest conservation orientation. This inversion, compounded by the consultative rather than co-decision position of regional government and BP Geopark in central government permitting, is the structural source of the vertical and horizontal legal risks identified above not merely a matter of norms being formally "complementary but not fully harmonious," but of an authority structure in which the actors most committed to conservation hold the least binding power, and the actors with binding power operate under the least conservation-oriented standards. If tourism exploitation is carried out aggressively without considering environmental carrying capacity and the UNESCO geopark principles, solely for the sake of boosting local economic growth, Merangin would not only face the threat of losing its UGGp status at the international level,

³⁸ Utama et al., "Indonesia 3 Badan Pengelola UNESCO Global Geopark Merangin Jambi 5 Biologi."

³⁹ Alan Briggs, Ross Dowling, and David Newsome, "Geoparks – Learnings from Australia," *Journal of Tourism Futures* 9, no. 3 (2023): 351–65, <https://doi.org/10.1108/JTF-11-2020-0204>.

but also risk administrative sanctions at the local level and potential legal claims based on violations of national conservation laws.

4. CONCLUSION

This study concludes that the governance of the Merangin UNESCO Global Geopark is exposed to significant legal risks arising from the imbalance between conservation and exploitation, despite the existence of a formally complementary regulatory framework consisting of the UNESCO Global Geoparks Operational Guidelines, Presidential Regulation No. 9 of 2019, Ministerial Regulation No. 2 of 2020, and Merangin Regency Regional Regulation No. 2 of 2018. The findings reveal that vertical legal risks emerge from the divergence between UNESCO's conservation-oriented standards and national or regional regulations that place greater emphasis on economic utilization, while horizontal legal risks arise from overlapping authority in licensing, zoning, and supervision. These risks are reflected in illegal mining activities, geosite vandalism, and weak inter-institutional coordination, indicating that regulatory complementarity does not necessarily guarantee governance effectiveness. The novelty of this study lies in the development of a legal-risk perspective for geopark governance by demonstrating how asymmetries in authority, enforceability, and conservation orientation across international, national, and regional legal instruments create structural vulnerabilities within UNESCO Global Geoparks. This study also extends the application of environmental law, sustainable development theory, and Earth Jurisprudence by integrating them into the analysis of geopark governance. Therefore, stronger regulatory harmonization, the incorporation of the precautionary principle into licensing and zoning decisions, enhanced intergovernmental coordination, the elevation of local authorities and geopark management bodies to a co-decision role in permit reviews, and stricter enforcement mechanisms are recommended to ensure the long-term sustainability of Merangin Geopark while safeguarding community welfare.

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Acknowledgements

The authors would like to express their sincere gratitude to the Editor and the anonymous Reviewers for their time, insightful comments, and constructive suggestions, which have significantly contributed to improving this article. The authors also hope that this article will provide valuable insights, make a meaningful contribution to ongoing discussions in the relevant field, and benefit readers and future researchers.

Funding Information

This research was independently funded by the authors.

Declaration of Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

Publication Ethics and Originality Statement

The authors affirm that this research is entirely original. This manuscript has not been previously published in print, online, or through any other medium, and it is not currently under

consideration for publication in any other journal. All sources cited in the reference list have been documented in accordance with applicable academic citation standards and ethical principles.

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The authors declare that generative artificial intelligence was used as an assisting tool during the preparation of this manuscript. Specifically, ChatGPT Open AI, Gemini and Grammarly were used to improve the language quality and overall readability of the text.

All AI-generated outputs were critically reviewed, edited, and verified by the authors to ensure accuracy and maintain scientific integrity. The authors assume full responsibility for the final content of the manuscript.

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