

Reconstructing Industrial Forest Spatial Planning Policy for Ecological Mitigation and Global Environmental Justice

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Abstract

The spatial planning of Industrial Forest Plantations (HTI) in Indonesia faces increasing challenges as economic expansion frequently generates ecological degradation and disaster risks. This article examines the need to reconstruct legal policies governing HTI spatial planning to integrate disaster-mitigation and ecological-justice principles. Using normative legal research with statutory, conceptual, and comparative approaches, this study analyzes Law No. 6 of 2023 and related forestry regulations, supported by empirical environmental data from the WALHI Environmental Outlook (2025) and KSDAE reports. The findings reveal that the current spatial planning framework facilitates what can be described as “legal deforestation,” where forest exploitation significantly exceeds the state’s ecological recovery capacity. This imbalance contributes to increasing hydrological disasters and socio-ecological injustices affecting local and indigenous communities. Comparative insights from Nordic forestry governance highlight the importance of transparent geospatial monitoring and balanced forest management. This article proposes a legal

reconstruction model that integrates the Rights of Nature, ecological disaster risk insurance, and stronger supremacy of spatial planning. Such reforms are essential to align Indonesia's forestry governance with global environmental standards and to ensure intergenerational ecological justice.

Keywords

Industrial Forest Plantation, Spatial Planning Law, Ecological Justice, Disaster Mitigation, Environmental Governance.

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Introduction

Indonesia's spatial territory constitutes a national resource that must be managed responsibly by the state to achieve the prosperity of the people. Spatial planning for Industrial Forest Plantations (HTI) is strategic, yet it often prioritizes industrial targets over ecological integrity. Philosophically, the state's *bestuurszorg* mandates welfare and disaster safety. However, the accumulation of ecological crises due to the mismanagement of nature has left the people in a state of "Anxious Indonesia," amid massive disaster threats.¹ The tragedy in Sumatra in November 2025, which claimed more than 900 lives, serves as undeniable empirical evidence of this systemic failure in spatial governance.²

A critical analysis of HTI spatial planning must consider the "double burden" experienced by indigenous communities during the green transition, where they face severe climate impacts while simultaneously losing land rights to industrial projects.³ Technocratic spatial planning often ignores the sovereignty of indigenous peoples over their customary territories,⁴ reflecting a profound "values crisis" where market-linked values override the relational and intrinsic values of nature.⁵ This aligns with the *Plantationocene*, a neocolonial land-governance regime that reorders nature to support global corporate

¹ WALHI, *Environmental Outlook 2025* (Jakarta: WALHI, 2025), [https://www.walhi.or.id/uploads/2024-Rilis/TLH 2025 rev.pdf](https://www.walhi.or.id/uploads/2024-Rilis/TLH%2025%20rev.pdf).

² Eno Suwarno, Prayoto Tonoto, and Anggi Prayoga, "Bencana Ekologis Sumatra: Kegagalan Tata Kelola Hutan Dalam Perspektif Ekologi Politik," *Jurnal Risalah Kebijakan Pertanian Dan Lingkungan* 12, no. 3 (2025): 278–89, <https://doi.org/10.29244/jkebijakan.v12i3.70176>.

³ Maria Båld, "Climate Change and the Green Transition: Double Burden for Indigenous Sámi Reindeer Herding Communities," *Ethics and Social Welfare* 19, no. 3 (2025): 217–35, <https://doi.org/10.1080/17496535.2025.2468663>.

⁴ Kadek Julia Mahadewi, "Disharmonisasi Regulasi Tata Ruang Dalam Perlindungan Hak Ulayat Di Bali Dalam Perspektif Undang-Undang Pokok Agraria," *Acta Comitas: Jurnal Hukum Kenotariatan* 10, no. 03 (2025): 612–26, <https://doi.org/10.24843/AC.2025.v10.i03.p12>.

⁵ Unai Pascual et al., "Diverse Values of Nature for Sustainability," *Nature* 620, no. 7975 (2023): 813–23, <https://doi.org/10.1038/s41586-023-06406-9>.

capital accumulation.⁶ In practice, state-imposed forest transitions are often regressive, destroying the multifunctional landscapes of local communities.⁷ Furthermore, the principle of sustainable development mandating the integration of environmental, social, and economic aspects to ensure the safety of current and future generations has not been fully internalized in these technical regulations.

Tensions between macroeconomic interests and environmental preservation became acute following the enactment of the Job Creation Law (Law No. 6 of 2023). While simplifying licensing, it drastically weakened environmental controls, correlating 631 corporate licenses with the loss of the region's natural defenses in disaster-affected areas.⁸ Throughout 2024, WALHI recorded 1,088 flood events,⁹ while national deforestation ranges from 700,000 to 3.8 million hectares annually, tragically, state budget allocations for forest rehabilitation are mathematically impossible to keep pace with the rate of annual forest loss.¹⁰

Comparative data provide a paradoxical picture: while claiming a stable Ecosystem Quality Index in conservation areas,¹¹ the reality

⁶ Ryan Stock, "Power for the Plantationocene: Solar Parks as the Colonial Form of an Energy Plantation," in *Climate Change and Critical Agrarian Studies*, 1st Editio (Routledge, 2023), 225–47, <https://www.taylorfrancis.com/chapters/oa-edit/10.4324/9781003467960-10/power-plantationocene-solar-parks-colonial-form-energy-plantation-ryan-stock>.

⁷ Melanie Pichler and Micah Ingalls, "Negotiating between Forest Conversion, Industrial Tree Plantations and Multifunctional Landscapes. Power and Politics in Forest Transitions," *Geoforum* 124 (2021): 185–94, <https://doi.org/10.1016/j.geoforum.2021.06.012>.

⁸ Suwarno, Tonoto, and Prayoga, "Bencana Ekologis Sumatra: Kegagalan Tata Kelola Hutan Dalam Perspektif Ekologi Politik."

⁹ WALHI, *Environmental Outlook 2025*, 10.

¹⁰ Jan Hoesada, "Program Reboisasi 2025," 8 (Jakarta, 2025), <https://www.ksap.org/sap/wp-content/uploads/2025/04/MAKALAH-REBOISASI.pdf>.

¹¹ Direktorat Jenderal Konservasi Sumber Daya Alam dan Ekosistem, "Laporan Kinerja Direktorat Jenderal KSDAE Tahun 2024" (Jakarta, 2024), 15, <https://ksdae.kehutan.go.id/dokumen/1631e33d-add1-425b-8682-f6b0d08bd9ce/download/>.

in HTI buffer zones shows severe hydrological degradation, and minor revenues pale in comparison to the trillions of rupiah in disaster recovery costs in Sumatra.¹² The flexibility of the RTRW review mechanism exacerbates this issue; according to Lon L. Fuller's theory, law will fail if its rules are unclear or change too frequently.¹³ Consequently, there is a positive correlation between the extent of monoculture HTI cover and the intensity of downstream flash floods,¹⁴ underscoring the systemic failure of life-protection instruments.¹⁵

Several previous studies have attempted to dissect this issue: Pambudhi and Ramadayanti highlighted the weakening of environmental protection;¹⁶ Roestamy et al. analyzed the role of the Land Bank in triggering conflict;¹⁷ Julia J.A. Shaw discussed spatial injustice in the Anthropocene era;¹⁸ Weck et al. emphasized place-based development;¹⁹ and Suwarno et al. revealed the mechanism of "Accumulation by Dispossession" in Sumatra.²⁰ Differing from those

¹² Direktorat Jenderal Konservasi Sumber Daya Alam dan Ekosistem, 45.

¹³ Lon L Fuller, *The Morality of Law* (New Haven: Yale University Press, 1964), 33, https://mguntur.id/files/ebook/ebook_1605607075_e2bf730c3254db5d74fc.pdf.

¹⁴ WALHI, *Environmental Outlook 2025*, 10.

¹⁵ Suwarno, Tonoto, and Prayoga, "Bencana Ekologis Sumatra: Kegagalan Tata Kelola Hutan Dalam Perspektif Ekologi Politik," 1.

¹⁶ Hario Danang Pambudhi and Ega Ramadayanti, "Menilai Kembali Politik Hukum Perlindungan Lingkungan Dalam Uu Cipta Kerja Untuk Mendukung Keberlanjutan Ekologis," *Jurnal Hukum Lingkungan Indonesia* 7, no. 2 (2021): 297–322, <https://doi.org/10.38011/jhli.v7i2.313>.

¹⁷ Martin Roestamy et al., "A Review of the Reliability of Land Bank Institution in Indonesia for Effective Land Management of Public Interest," *Land Use Policy* 120 (2022): 106275, <https://doi.org/10.1016/j.landusepol.2022.106275>.

¹⁸ Julia J A Shaw and Hillary J Shaw, "Mapping the Technologies of Spatial (in) Justice in the Anthropocene," *Information & Communications Technology Law* 25, no. 1 (2016): 32–49, <https://doi.org/10.1080/13600834.2015.1134147>.

¹⁹ Sabine Weck, Ali Madanipour, and Peter Schmitt, "Place-Based Development and Spatial Justice," *European Planning Studies* (Taylor & Francis, 2022), <https://doi.org/10.1080/09654313.2021.1928038>.

²⁰ Suwarno, Tonoto, and Prayoga, "Bencana Ekologis Sumatra: Kegagalan Tata Kelola Hutan Dalam Perspektif Ekologi Politik," 1.

studies, this article offers a legal model reconstruction that integrates Båld's "Double Burden" theory, Pascual et al.'s values crisis, national reforestation failures, and the *Plantationocene* theory with the "Rights of Nature" paradigm.

This study addresses two main research questions:

1. How does Indonesia's current legal framework for HTI spatial planning contribute to ecological risks and social injustice?
2. What legal reconstruction model can ensure disaster mitigation and ecological justice in industrial forest governance?

By proposing a model that includes mandatory ecological disaster risk insurance and transparent geospatial monitoring, this article explicitly contributes to aligning Indonesia's forestry governance with global standards (e.g., EUDR) and ensuring intergenerational ecological justice.

This research employs normative legal research to reconstruct the spatial planning law governing Industrial Forest Plantations in Indonesia. The study applies several approaches, including statutory, conceptual, and comparative.²¹ The statutory approach examines relevant legal instruments, particularly Law No. 6 of 2023 on Job Creation, Law No. 41 of 1999 on Forestry, and Law No. 32 of 2009 on Environmental Protection. The conceptual approach utilizes theories of ecological justice, the *Plantationocene* framework, and the diverse values of the nature perspective. The comparative approach analyzes forest governance models in Nordic countries, particularly Sweden and Finland, to identify best practices for sustainable forest management. Legal materials are analyzed qualitatively using interpretative and prescriptive legal analysis to formulate recommendations for legal reform.

²¹ Irwansyah, *Penelitian Hukum* (Yogyakarta: Mirra Buana Media, 2022).

A. Regulatory Inconsistencies in HTI Spatial Planning and the Escalation of Hydrological Disasters

The spatial planning of Industrial Forest Plantations (HTI) in Indonesia is currently in a vortex of conflicting norms, triggering vulnerabilities due to the imbalance between extraction and the recovery of upstream watershed ecosystems. Juridically, Article 13 of the Job Creation Law introduced the PKKPR mechanism as a highly centralized business licensing instrument that sometimes overlooks unique local geological characteristics. However, this acceleration risks disregarding Article 12 of Law No. 32 of 2009, which mandates determining environmental carrying capacity as an absolute limit for spatial utilization. The weakening of ecological control instruments to accelerate capital has created what is called “legal deforestation,” in which ecosystem alteration is administratively valid but ecologically detrimental for rural residents.²²

The values crisis in this regulation is even more evident when analyzed through the framework of Pascual et al., in which legal rules often support powerful interests in determining which values should prevail in national decision-making.²³ In HTI spatial planning, the market value of industrial timber has frequently prevailed over the hydrological value of primary natural forests. Consequently, the state’s reforestation policies are often merely the re-territorialization of forest areas in the name of monoculture planting, rather than the restoration of diverse natural functions. Pichler and Ingalls call this phenomenon a regressive forest transition, in which an increase in industrial tree cover is followed by a significant decline in the quality of the original ecosystem and in local communities’ access to their multifunctional landscapes.²⁴

²² This research suggests that HTI licensing legality serves as a shield against criminal liability for upstream ecosystem destruction.

²³ Pascual et al., “Diverse Values of Nature for Sustainability,” 817.

²⁴ Pichler and Ingalls, “Negotiating between Forest Conversion, Industrial Tree Plantations and Multifunctional Landscapes. Power and Politics in Forest Transitions,” 186.

The Sumatra tragedy of November 2025, which claimed more than 900 lives, is a logical consequence of the failure to synchronize extraction permits with site conservation obligations in upstream areas.²⁵ Geospatial analysis shows that the locations with the highest concentration of fatalities were located directly below upstream areas that underwent massive deforestation for the benefit of 631 corporate extractive industry licenses, including HTI.²⁶ Spatial planning that divides land into monoculture production blocks without considering watershed integrity may significantly increase hydrological disaster risks. Spatial planning law should mandate that corporations fund real-time satellite imagery to safeguard water-retaining vegetation in their upstream areas, thereby preventing structural disasters.

The lack of synchronization is clearly visible in the spatial planning hierarchy between the center and the regions, which sometimes overlap due to insufficient technical coordination on the ground. Article 174 of the Job Creation Law prioritizes national strategic policies that can override regional plans, so areas designated locally as water protection zones can be converted into timber production blocks to meet export targets. The failure of law to maintain these protection zones has resulted in severe degradation of hydrological systems. WALHI notes that annual flash floods indicate that spatial planning must be better designed for people's safety, rather than prioritizing the logistics efficiency of corporate investments that overlook ecological protection.²⁷

An analysis of Government Regulation No. 21 of 2021 reveals systemic risks in the RTRW review mechanism, which requires stronger scientific accountability to the broader public. Article 20, paragraph (5) of this regulation is sometimes used to grant administrative leniency for past spatial planning violations by forestry corporations. Under the mechanisms of Articles 110A and 110B of the Job Creation Law, millions of hectares of plantation overlap in

²⁵ Suwarno, Tonoto, and Prayoga, "Bencana Ekologis Sumatra: Kegagalan Tata Kelola Hutan Dalam Perspektif Ekologi Politik," 1.

²⁶ Suwarno, Tonoto, and Prayoga, 1.

²⁷ WALHI, *Environmental Outlook 2025*, 10.

forest areas are granted administrative forgiveness of fines, which WALHI views as a mechanism that weakens environmental compliance.²⁸ This practice undermines the integrity of spatial planning law as a tool for environmental control. Granting administrative leniency for spatial violations weakens legal morality and reduces corporate deterrence against zoning violations.²⁹

The 2024 KSDAE Performance Report notes that ecosystem recovery in conservation areas met targets; however, this achievement is challenged by degradation in surrounding production areas due to inadequate supervision. Government data shows the restoration of thousands of hectares of peatlands, but its effectiveness can be negated by new HTI licenses that still allow canal drainage in adjacent upstream areas.³⁰ Current national spatial planning policies still run on separate tracks, separating conservation targets from production activities. Without the unification of ecological protection standards across sectors, government performance reports will struggle to ensure the safety of increasingly vulnerable forest residents.

The principle of sustainable development in Article 33, paragraph (4), of the 1945 Constitution demands a balance between the economy and ecology; yet HTI operations on peatlands often disrupt this balance. The construction of industrial HTI drainage canals has caused land subsidence and extreme fire vulnerability, releasing large amounts of carbon into the atmosphere. Economic losses from forest fires highlight the high cost of spatial planning that does not fully account for the ecological characteristics of peatlands. Future spatial planning must mandate comprehensive hydrological restoration as a primary prerequisite for industrial operations on sensitive lands that serve as global emission sinks.

The effectiveness of the Strategic Environmental Assessment (KLHS) under Article 15 of Law No. 32 of 2009 is key to the

²⁸ WALHI, 43.

²⁹ Waspiah, W., Rosida, H., Maharani, A., Maryani, I., Detalim, M., & Arifin, R. Law Reform in Corporate Criminalization in Environmental Damage Cases in Indonesia. *Journal of Law and Legal Reform*, 4(4), (2023):619-647. <https://doi.org/10.15294/jllr.v4i4.74133>

³⁰ Direktorat Jenderal Konservasi Sumber Daya Alam dan Ekosistem, "Laporan Kinerja Direktorat Jenderal KSDAE Tahun 2024," 45.

credibility of Indonesia's national disaster mitigation efforts. KLHS should be able to cancel HTI zoning plans in landslide-prone areas. In reality, this document is sometimes prepared merely as an administrative requirement to expedite corporate investment licensing procedures. Consequently, spatial planning loses its early detection function, and HTI development can be directed into sensitive geological zones, correlating with landslide events throughout 2024.³¹ This highlights that current spatial planning law must become more robust in protecting human life from the threats posed by natural disasters.

The internalization of environmental externality costs through the “polluter pays” principle in Article 2, letter j of the PPLH Law requires fairer and more open implementation. The costs of restoring rivers polluted by chemical waste or rehabilitating land after flash floods in HTI areas are often charged to the state budget, drawing on minimal funds from the national disaster reserve. Future spatial planning must mandate an “Ecological Disaster Risk Insurance” instrument for every corporate HTI license holder as an absolute requirement for their operations. This instrument is essential so that every damage-causing event has a guaranteed financial recovery without excessively burdening the public budget.

Silvicultural regulations in Government Regulation No. 23 of 2021 have not strictly prohibited the planting of exotic monoculture species in crucial watershed areas. The use of water-hungry species alters the microclimate in upstream areas and reduces the soil's capacity to absorb water during extreme rainfall events. Micro-spatial planning within concession areas that mandate 10% local protection zones (Article 19 of PP 23/2021) is sometimes ignored or carried out only symbolically on marginal lands. Supervision of this technical compliance must be strengthened through an independent spatial audit system that involves active participation by civil society.

It is important to acknowledge that the government has made commendable efforts to improve spatial governance. The implementation of the One Map Policy and digitalization through the GISTARU platform are significant technological advancements

³¹ WALHI, *Environmental Outlook 2025*, 10.

aimed at increasing transparency and resolving overlapping claims. However, these positive steps must be matched with field-level accuracy. Anomalies still occasionally occur between corporate administrative reports and independent satellite monitoring regarding land cover conditions in closed upstream concession areas. Without absolute transparency in spatial data, digitalization may not fully prevent ecosystem degradation. Legal reconstruction must guarantee public access to HTI license coordinates to strengthen these government efforts and prevent the manipulation of conservation area boundaries.

Legal needs currently demand a synchronization between the Job Creation Law and independent ecological audit standards that are binding on national law. Without strengthening Article 15 of the PPLH Law to make KLHS determinative, accelerating investment through PKKPR could inadvertently escalate ecological risks. The law must guarantee that environmental instruments are absolute requirements with the power to modify or cancel spatial utilization plans that pose a high risk to public safety. This is necessary to maintain the dignity of the state in protecting citizens from uncontrolled industrial expansion.

HTI spatial planning, synchronized with environmental carrying capacity, will determine Indonesia's strategic position in the future global circular economy. The international world will demand transparent "Ecological Risk Reports" as a condition for sustainable investment and access to global carbon trade markets. By building a legal system that internalizes disaster risk from the planning stage, Indonesia not only protects its citizens but also provides certainty for global supply chains, free from severe environmental degradation. The global benefit of this step is Indonesia's real contribution to significantly reducing global emissions in support of long-term planetary sustainability.

B. The *Plantationocene* Paradigm and Social Injustice for Indigenous Peoples

The integration of social justice in HTI spatial planning policy is a moral demand guaranteed by the Constitution; however, reality often reflects a mechanism of “Accumulation by Dispossession” or accumulation through the displacement of local communities’ rights.³² Maria Bâld provides a critical perspective on the “double burden” experienced by indigenous peoples, where they are forced to face climate disaster risks as well as the threat of displacement in the name of massive industrial green transitions.³³ Forestry spatial planning, highly centralized under the post-Job Creation Law, reflects this pattern. The existence of customary communities in upstream areas is often sidelined to facilitate HTI permits claimed as national reforestation projects, which frequently disrupt traditional socio-ecological orders.

The term *Plantationocene*, as coined by Ryan Stock, reinforces this analysis by examining how HTI spatial planning in Indonesia institutionalizes conflict through the structural economic reordering of nature.³⁴ Stock argues that industrial plantation regimes systematically marginalize landless peasant populations from food sovereignty. In the Indonesian context, the granting of extensive HTI licenses covering 1.48 million hectares to large corporations has created severe socio-economic pressures for village autonomy. Transforming forests into monoculture timber factories is a form of social reordering that imposes neocolonial relations, in which indigenous peoples lose access to forest medicines and food sources to meet global pulp and paper supply chain needs.³⁵ To illustrate this human impact, agrarian conflicts in HTI areas in Jambi serve as a clear

³² Suwarno, Tonoto, and Prayoga, “Bencana Ekologis Sumatra: Kegagalan Tata Kelola Hutan Dalam Perspektif Ekologi Politik,” 1.

³³ Bâld, “Climate Change and the Green Transition: Double Burden for Indigenous Sámi Reindeer Herding Communities,” 12.

³⁴ Stock, “Power for the Plantationocene: Solar Parks as the Colonial Form of an Energy Plantation,” 227.

³⁵ Stock, “Power for the Plantationocene: Solar Parks as the Colonial Form of an Energy Plantation.”

case study. Local oil palm smallholders and indigenous groups are frequently marginalized by corporate concessions, underscoring how spatial dispossession actively undermines local livelihoods and highlighting the urgent need for a restorative justice approach rather than security-based resolutions.³⁶

This crisis is exacerbated by the legal system's failure to recognize the diverse values of nature as experienced relationally by indigenous peoples. Pascual et al. emphasize that environmental policies focusing solely on instrumental values (e.g., timber as a commodity) fail to capture the deep spiritual and identity values that bind humans to their environment.³⁷ For indigenous communities in Sumatra and Kalimantan, the forest is not just a row of industrial trees but a culturally significant space whose intrinsic value cannot be adequately compensated financially. The marginalization of these values also severely impacts gender justice. A case study in Riau illustrates this disparity: rural women who rely heavily on non-timber forest products for family medicine and nutrition have lost access to these essential spaces due to their conversion into administratively rigid monoculture industrial forests.³⁸ The reconstruction of HTI spatial planning law must shift from a market-oriented, single-model approach to a framework that respects the plurality of nature's values, guaranteeing the sovereignty of indigenous peoples over their living space as a prerequisite for genuine agrarian climate justice.³⁹

The main obstacle in the recognition of customary rights lies in Article 67 of Law No. 41 of 1999, which mandates recognition through local regulations (Perda) that are highly political and administratively complex for indigenous citizens. Amidst this

³⁶ Muhammad Reza Halomoan, Arya Hadi Dharmawan, and Satyawan Sunito, "Social Forestry as Solution to Agrarian Conflicts? A Case Study between Oil Palm Smallholders and Industrial Plantations in Jambi, Indonesia," *Forest and Society* 9, no. 2 (2025): 449–70, <https://doi.org/10.24259/fs.v9i2.26656>.

³⁷ Pascual et al., "Diverse Values of Nature for Sustainability," 813.

³⁸ Faza Dhora Nailufar and Aulia Rahmawati, "Ecofeminism of Forestry Conservation in Riau," *KnE Social Sciences*, 2022, 1240–52, <https://doi.org/10.18502/kss.v7i9.11013>.

³⁹ The author asserts that customary spatial sovereignty must be accommodated as a prerequisite for global ecological justice.

procedural hurdle, the state continues to issue HTI permits over customary territories through rapid PKKPR procedures, which can significantly alter socio-ecological structures maintained for generations.⁴⁰ WALHI notes an increase in the criminalization of environmental defenders and indigenous peoples, with 1,131 individuals becoming victims of violence and criminalization in the last ten years while attempting to defend their living space from massive extractive industrial expansion.⁴¹ This indicates a need for spatial planning laws to be more protective of local communities.

The failure to recognize indigenous rights in HTI spatial planning hinders the achievement of Indonesia's national SDG targets, especially Goals 16 on just institutions and 13 on global climate action. The international community demands that marketed timber products be free from social conflict and ecological degradation. Legal reconstruction must mandate the implementation of the FPIC (Free, Prior, and Informed Consent) principle as an absolute condition for issuing industrial operation permits anywhere in the archipelago. Without the consent of directly affected communities, the granting of HTI licenses should be considered procedurally and substantively flawed, in accordance with international human rights standards.

The policy regarding "Life Plants" (Tanaman Kehidupan), covering 20% in Article 234 of Government Regulation No. 23 of 2021, is sometimes implemented in ways that provide minimal economic utility as a form of social compensation. The allocated land is frequently marginal, possessing high disaster vulnerability or difficult logistical access. Just spatial planning demands a fair distribution of economic benefits, where the community has the right to manage fertile areas to support independent and sustainable local food security. Distributive justice also requires a fair sharing of environmental burdens. Currently, HTI companies enjoy significant economic profits. At the same time, residents often bear the burden of river water pollution and the loss of forest food sources due to the

⁴⁰ Eka Aurihan Djasriain, *Perizinan Pemanfaatan Ruang* (Yogyakarta: Lembaga Pengkajian Tata Ruang, 2022), 118.

⁴¹ WALHI, *Environmental Outlook 2025*, 30.

extensive use of chemical substances in monoculture industrial areas that can degrade soil nutrients for future generations.⁴² Welfare-oriented spatial planning must mandate wide social buffer zones as safe boundaries between industrial activities and the settlements of indigenous people.⁴³

Public participation in the spatial planning process, as regulated in Article 60 of Law No. 26 of 2007, often lacks meaningful implementation at the remote village level. Spatial planning socialization frequently involves only a few village elites, failing to reach women and youth groups who will bear the long-term impacts of converting natural forests into industrial monocultures. This administrative marginalization deprives communities of their right to essential knowledge regarding their living spaces. Community empowerment through forestry partnership schemes must be reformed to avoid exploitative patron-client relationships and provide equitable economic benefits for farmers.⁴⁴ Social spatial planning must provide people with the autonomy to determine the types of plants that suit their local wisdom and food needs, rather than strictly adhering to single industrial commodities.

People's spatial sovereignty will only be achieved through transparent spatial data that is accountable to international conventions on the right to environmental information. The public must have the right to access the HTI concession coordinate boundaries in real time to exercise social control over potential zoning violations. Restricting access to information hinders the creation of democratic, transparent forest governance. Current legal needs require revising Article 67 of the Forestry Law to simplify the recognition mechanism for indigenous peoples by establishing a fast,

⁴² Ajeng Chantika Rinjani et al., "Dampak Eksploitasi Hutan Terhadap Ekonomi Dan Lingkungan," *Indonesian Journal of Economy and Education Economy* 2, no. 2 (2024): 419–24, <https://doi.org/10.61214/ijen.v2i2.529>.

⁴³ Febrian Chandra, "Pengelolaan Kehutanan Berbasis Masyarakat Hukum Adat Dalam Kerangka Konstitusi Hijau Di Indonesia," *Adagium: Jurnal Ilmiah Hukum* 3, no. 1 (2025): 104–19, <https://doi.org/10.70308/adagium.v3i1.67>.

⁴⁴ Halomoan, Dharmawan, and Sunito, "Social Forestry as Solution to Agrarian Conflicts? A Case Study between Oil Palm Smallholders and Industrial Plantations in Jambi, Indonesia."

fair, and transparent executive determination process. According to Maria Båld, the struggle for climate justice must include the recognition of non-material and relational values held by indigenous communities to prevent a “double burden” in the nation’s green transition.⁴⁵ Only by addressing the exploitative structures of the *Plantationocene* and accommodating the plurality of nature’s values can Indonesia realize genuine spatial justice and align its forestry governance with global human rights standards.

C. Comparative Analysis of Nordic Forestry Governance Providing a Perspective on Forest Management that Values Multifunctional Landscapes through Big Geodata

To formulate an ideal HTI spatial planning and legal reconstruction model for disaster mitigation, Indonesia needs to conduct comparative studies with Nordic countries that have successfully integrated the timber industry with environmental security. Sweden and Finland demonstrate that a stable and participatory legal system is key to maintaining forest integrity against degradation that can trigger natural disasters. Lessons from these two countries are highly relevant to accelerating Indonesia’s SDGs targets, specifically Goal 13 on climate action and Goal 15 on protecting terrestrial ecosystems, through modern, transparent, and accountable spatial planning legal instruments.

Tabel 1. A Comparative Analysis of Forest Management Systems in Indonesia and Nordic Countries

Indicator	Indonesia	Sweden	Finland
Forest ownership	Dominated by corporate concessions	Mixed ownership	Mostly private ownership

⁴⁵ Båld, “Climate Change and the Green Transition: Double Burden for Indigenous Sámi Reindeer Herding Communities.”

Spatial monitoring	Limited transparency	Open monitoring	Open geodata	big
Certification	SVLK	FSC / PEFC	FSC / PEFC	
Indigenous participation	Limited	Sami consultation	Sami participation	

Source: Compiled by the author, 2025

Finland provides crucial lessons on integrating harvester measurements with open big geodata to ensure transparency and accurate forest management. Vähä-Konka et al. show that the use of open geospatial big data enables governments and industry to precisely estimate sawlog proportions and timber assortment reductions within harvesting areas.⁴⁶ This technology enables environmental audits to be conducted down to the tap level, individually for each tree, thereby radically reducing the risk of falsifying land cover data. If this model were adopted in Indonesia’s legal policy, claims of “whitewashing” spatial planning violations through the Job Creation Law could be mitigated with a digital verification system that cannot be interfered with by regional political-economic elite interests.

Sweden implements a model known as The Swedish Model, which rests on the principle of equal weighting between timber production goals and the preservation of sensitive natural forest ecosystems for the nation’s future. Under the Swedish Forestry Act (Skogsvårdslagen), every industrial tree felling must be accompanied by a mandatory replanting obligation, strictly supervised by state authorities year-round, without any practical political compromise for the elite.⁴⁷ Most notable is the recognition of Allemansrätten or the right of public access to nature, which creates massive social

⁴⁶ Ville Vähä-Konka et al., “Estimating Timber Assortment Reduction and Sawlog Proportions with the Application of Harvester Measurements and Open Big Geodata,” *Trees, Forests and People* 20 (2025): 100811, <https://doi.org/10.1016/j.tfp.2025.100811>.

⁴⁷ Thomas Kronholm, “Forest Companies’ Advice and Services to Non-Industrial Private Forest Owners Regarding Forest Damage in Sweden,” *Rapport Från Institutionen För Skogens Biomaterial Och Teknologi*, no. 9 (2024), <https://pub.epsilon.slu.se/36126/1/kronholm-t-20250103.pdf>.

control from citizens over industrial activities in their national forest areas.⁴⁸ This right of access forces corporations to maintain the environmental quality of their areas in a transparent manner for all.

The fundamental difference between the Nordic system and Indonesia lies in the land ownership structure and the level of public trust in the integrity of Indonesia's national spatial planning law, which remains fragile and volatile in the regions. In Sweden and Finland, the majority of forests are owned by individuals or small-scale family groups, so spatial planning is conducted in a participatory manner through independent, honest, and accountable forest cooperatives open to the public.⁴⁹ In Indonesia, the dominance of giant HTI concessions, centralized in the hands of a few, breaks the emotional connection between land managers and the dynamic stability of local ecosystems across vast national forest fields. The low motivation of corporations to mitigate is driven by a management paradigm that pursues only large profit gains.⁵⁰

Finland has a digital forestry information system, Metsään.fi, that is very open to landowners, the government, and the general public, and is accountable to the global community that pays attention to Earth's sustainability.⁵¹ Data on land-cover changes and forest-fire risks are presented in real time, based on satellite imagery. They are openly and transparently accessible to all citizens through the official state digital portal. In Indonesia, the GISTARU system still faces significant challenges in field data accuracy, leading to early

⁴⁸ Seija Tuulentie et al., "Multiple Use of Forests," *Continuous Cover Forestry in Boreal Nordic Countries*, 2025, 169, <https://library.oapen.org/bitstream/handle/20.500.12657/96103/1/9783031704840.pdf#page=175>.

⁴⁹ Juulia Kuhlman, "Challenging the Concept of Active Forest Ownership: The Perspective of Women Forest Owners in Finland," *Helsinki: University of Helsinki*, 2024, <https://helda.helsinki.fi/server/api/core/bitstreams/1f2e2ea0-081e-44c7-a62f-4cb1ada06962/content>.

⁵⁰ Dody Ruswandi, *Tata Kelola Kolaboratif: Solusi Ketahanan Hutan Di Indonesia* (Deepublish, 2024), 77.

⁵¹ Salla Rantala et al., "Governance of Forests and Governance of Forest Information: Interlinkages in the Age of Open and Digital Data," *Forest Policy and Economics* 113 (2020): 102123, <https://doi.org/10.1016/j.forpol.2020.102123>.

detection failures of potential ecological disasters in remote HTI concession areas that are difficult for the public to monitor independently. Information openness is an absolute prerequisite for effective community-based disaster mitigation.

Sweden and Finland also implement rigorous forest certification systems by integrating national standards with international standards such as FSC or PEFC, which are mandatory for all players in their forestry industries. This certification requires periodic ecological audits that include assessments of the land's ability to resist erosion and to maintain consistent watershed hydrological functions for the national and broader international public.⁵² Indonesia already has SVLK, but its enforcement is often seen as merely administrative and formalistic by the global trade community, which is increasingly critical of tropical deforestation. Legal reconstruction must mandate certification standards that include transparent disaster risk audits.

The aspects of education and environmental ethics for foresters in Nordic countries are emphasized as part of their visionary national ecological defense strategy for the future of those nations forever for the international community.⁵³ Forest managers there are trained to think of themselves as “ecosystem gatekeepers” responsible for the survival of human civilization, not just pursuing annual timber-volume targets for the factory in the name of corporate short-term gain. In Indonesia, the orientation of forestry education still needs reform to instill ecocentric values that prioritize the safety of nature over the short-term economic profit targets of massive extractive industries across the archipelago. Increasing the capacity of the forest human resource is key to the success of sustainable green law implementation.

⁵² Hanna Lindahl and Emma Andersson, “Symbolic or Strategic? Understanding FSC and PEFC Certification in Resource-Constrained SMEs: The Swedish Timber Industry,” 2025, <https://www.diva-portal.org/smash/get/diva2:1969184/FULLTEXT02.pdf>.

⁵³ Emil Olofsson, “On The Side of the Forest Owner: A Discourse Analysis of the Swedish Reception of the EU ForestStrategy for 2030,” 2023, <https://www.diva-portal.org/smash/record.jsf?pid=diva2:1777456>.

Forest spatial plans in Sweden are very stable and do not change frequently following a sudden change in political leadership at the national or local level, which is essential for global investors. This provides certainty for ecosystems to regenerate naturally, without sudden land-use disruptions for the sake of pragmatic, fleeting elites.⁵⁴ In Indonesia, the flexibility of RTRW revisions under the Job Creation Law has instead undermined the long-term sustainability vision of development and created uncertainty about the protection of flash-flood-prone areas that kill citizens.

Sweden and Finland have successfully bequeathed forest qualities that have remained intact for more than a hundred years, even though their industries continue to operate on a massive scale year-round without interruption, supporting the national economy. They view the forest as “Natural Capital” whose value must not decrease for the sake of their grandchildren’s welfare, given the current global extreme climate crisis. Indonesia must learn not just to count today’s timber profits, but also to calculate the potential disaster costs borne by future generations due to exploitative spatial planning policies. Intergenerational justice must be the moral compass in every decision on the utilization of Indonesia’s vast and rich national forest space.

The Bioeconomy concept in Finland directs the HTI industry to produce innovative, low-carbon products to support a circular economy that is climate-friendly for the broader, sustainable international community. Spatial planning is designed to support green industrial ecosystems that minimize waste and systemic soil damage, while remaining sustainable.⁵⁵ Indonesia must begin shifting the focus of HTI spatial planning to support the downstreaming of high-value-added cellulose industries, so that economic productivity

⁵⁴ Dan Binkley, “Assmann Review: Spatial Ecology of Rotational and Continuous Cover Forestry in Boreal Landscapes,” *European Journal of Forest Research* 144, no. 2 (2025): 225–54, <https://doi.org/10.1007/s10342-024-01756-z>.

⁵⁵ Mikko Paloneva and Saana Takamäki, “Summary of Sectoral Low-Carbon Road Maps,” 2021, https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/162851/TEM_2021_9.pdf.

increases without continuing to clear primary natural forests in upstream watersheds. Forest product diversification will reduce pressure on destructive land conversion in the vast archipelago.

Land conflict resolution strategies in Sweden are conducted through equal dialogue forums between the government, industry, and the indigenous community (Sami) in a dignified manner, ensuring that both disputing parties are treated fairly and transparently to the public.⁵⁶ The state acts as a fair mediator and upholds distributive justice values in making sovereign regional spatial decisions honestly for all its people, without discrimination against any capital in favor of the elite. In Indonesia, the state is often caught defending HTI license owners in the name of national investment targets, leading to a loss of public trust in the fairness of the national forestry spatial planning law. Learning from the Nordics means learning to restore the state's authority as a guardian of justice.

Sweden and Finland prove that sustainability incentives work effectively when supported by strict law enforcement, without favoritism toward any violators in the forestry industry. Companies that damage water protection zones are subject to very heavy fines, up to the permanent closure of their business licenses, in the name of their priceless national ecological safety.⁵⁷ This strict law model is worthy of application in the reconstruction of HTI regulation in Indonesia to encourage spatial discipline among massive corporations in the rich and beautiful archipelago. Only with a law that has integrity and long-term vision can forest sustainability and national prosperity run in harmony.

Current legal needs urge the adoption of technical standards for spatial planning based on ecosystem landscapes, free from the

⁵⁶ Rasmus Kløcker Larsen et al., "Negotiated Agreements and Sámi Reindeer Herding in Sweden: Evaluating Outcomes," *Society & Natural Resources* 37, no. 7 (2024): 981–99, <https://doi.org/10.1080/08941920.2024.2321874>.

⁵⁷ Tatiana Dunaeva, "From Trees to Trust: Exploring Community Perceptions of Municipal Forest Management in Two Finnish Municipalities," 2025, https://www.theseus.fi/bitstream/handle/10024/880961/Tatiana_Dunaeva.pdf?sequence=2; Richard Pokorny-Kindlman, "Navigating EU-Sweden Forestry Disputes," *Environmental Challenges* 15 (2024): 100927, <https://doi.org/10.1016/j.envc.2024.100927>.

convoluted, bureaucratically rigid administrative boundaries between regions or ministries in Indonesia. The government needs to immediately formulate regulations that mandate annual spatial planning compliance audits by independent third parties for all HTI license holders in Indonesia, openly and without exception, for the entire national public. The strengthening of Article 20 of the Spatial Planning Law must ensure that long-term plans cannot be revised solely because of a PSN that has not undergone a thorough KLHS for the safety of the broader public. Spatial stability is key to protecting regional ecological functions from disaster threats.

The synchronization of Indonesia's spatial planning standards with Nordic standards will facilitate the integration of Indonesia's forest products into the future sustainable global green economy for all of us in the international world. By implementing data transparency and plan stability, Indonesia can attract high-quality international capital to support peatland restoration and humane forest management on a wide, deep scale for global civilization. The global benefit of this step is Indonesia's significant contribution to lowering the earth's temperature through forest management with integrity, and becoming a realistic reference for other developing countries in the future.

D. Reconstructing the *Ius Constituendum* Legal Model Must Integrate the Rights of Nature and Intergenerational Spatial Justice

The reconstruction of HTI spatial planning legal policy in Indonesia must begin with a paradigm shift from anthropocentrism toward inclusive ecocentrism to enhance resilience against national disasters. Sustainable development can only be achieved if the law recognizes nature as a subject with an intrinsic right to regenerate and have its functions preserved for the future of the nation. The future legal model must integrate the concept of "Rights of Nature" to fortify forests against unregulated economic expansion, which frequently exacerbates severe ecological degradation and national

disasters. Nature must no longer be viewed merely as a “factor of production,” but as a recognized legal subject.

The first strategic step in formulating this legal model is to establish the supremacy of the Regional Spatial Plan over all sectoral operational permits in national law. In accordance with the mandate of Article 33 of the 1945 Constitution, an HTI license must not be issued before there is a clear, ecologically and sociologically valid zoning at the forest landscape level for local communities. This requires unifying national spatial data through the One Map Policy system, which has final legal force, resolving data dualism between ministries that triggers land conflicts and confusion over disaster mitigation responsibilities. Spatial certainty is the primary foundation of national sustainability.

Digitalization through the GISTARU and OSS systems must have their functions upgraded to a participatory and transparent “People’s Spatial Audit” instrument.⁵⁸ The broader community, including the younger generation, must be provided with formal legal channels to monitor land cover changes in concession areas in real time using accurate satellite imagery. This digital participation is a form of effective spatial democracy that helps mitigate administrative irregularities and spatial violations that have thus far hindered the creation of just and safe forest governance. Transparency is essential for sustainable forest management practices.

Reconstruction of law must mandate the application of the “Strict Corporate Liability” principle against all forms of pollution and natural damage within their working areas. HTI companies should be prohibited from exploiting administrative loopholes to avoid sanctions when ecological disasters such as forest fires or flash floods occur, thereby harming national public interests. The law must impose strict sanctions, including permanent license revocation, on corporations proven to ignore water protection and social zoning in their industrial operations for short-term corporate gain. Corporate legal responsibility must cover all negative environmental externalities.

⁵⁸ Eka Aurihan Djasriain, *Perizinan Pemanfaatan Ruang*, 102.

The new legal model must introduce a “Mandatory Environmental Insurance” scheme as an absolute requirement for all forestry concessionaires in Indonesia. This insurance fund serves as a guarantee for ecosystem recovery if management failures degrade vital local ecosystem services, posing risks to local communities. Internalization of risk costs will encourage corporations to be more disciplined in planning their areas, in line with the precautionary principle mandated in Law No. 32 of 2009. Those who neglect these standards must internalize the financial costs of ecological restoration.

In the global social dimension, legal reconstruction must establish a fair ecological profit-sharing mechanism for regional governments and indigenous communities in national production forest areas. Every inch of protected forest successfully maintained in its function by the region must receive fiscal compensation through an Ecological Fiscal Transfer scheme. This policy will change the perception of areas that previously saw forests as investment burdens into green economic assets, providing tangible benefits for the long-term welfare of residents. Financial incentives must be directed toward long-term preservation for sustainable development.

The legal model reconstruction must protect intergenerational justice by reserving conservation areas in every significant corporate HTI concession. The law should establish a minimum area standard (e.g., at least 20%) that must be conserved in its entirety as a biodiversity reservoir and disaster buffer. This principle embodies a collective moral promise not to exhaust all natural resource potential today, but to preserve it as a biological heritage for future generations amidst severe global climate change risks. Justice is not just for those living today, but for all time.

The strengthening of the environmental judiciary function is vital to maintaining the integrity of national forestry spatial planning law.⁵⁹ A specialized environmental chamber in the court is needed, with judges certified in disaster mitigation and deeply understanding

⁵⁹ Hartati Hartati, Febrian Chandra, and Adithiya Diar, “Spatial Planning for Mining Exploitation Rights in Forest Area,” *ADLIYA: Jurnal Hukum Dan Kemanusiaan* 17, no. 1 (2023): 19–34, <https://doi.org/10.15575/ADLIYA.V17I1.22747>.

the complexities of tropical ecosystems and indigenous rights. Consistent jurisprudence on the priority of ecological functions in spatial disputes will provide clear direction for improving the behavior of the bureaucracy and forestry industry players. The judiciary must serve as the final bastion of national ecological justice.

The future legal model must encourage the transformation of the HTI industry toward a low-carbon economy based on a socially just Carbon Economic Value. The law must provide legal certainty for carbon trading schemes that benefit the state and involve local communities as primary partners in safeguarding the archipelago's capacity to absorb greenhouse gases.⁶⁰ This step is projected to increase the competitiveness of Indonesia's forestry industry in international markets, which now demand strict sustainability standards. Carbon must be seen as an economic opportunity aligned with urgent global climate mitigation.

Empowering silvicultural research and technology based on indigenous species must be integrated into corporate spatial operations regulations. The law should mandate that large corporations fund local tree-breeding research to maintain ecosystem resilience against the threat of invasive pests and the severe impacts of climate change.⁶¹ Spatial planning based on scientific policy will yield more sustainable land productivity than planning based solely on industrial timber volume targets. Innovation is key to a sustainable forestry industry.

This legal policy reconstruction must also include the obligation for every HTI license holder to provide knowledge transfers to communities around their areas.⁶² People's welfare is measured by their ability to manage natural resources independently

⁶⁰ S P Rohmatin Agustina et al., *Konservasi Sumber Daya Alam Dan Lingkungan* (Azzia Karya Bersama, 2025).

⁶¹ Douglass F Jacobs et al., "Reintroduction of At-Risk Forest Tree Species Using Biotechnology Depends on Regulatory Policy, Informed by Science and with Public Support," *New Forests* 54, no. 4 (2023): 587–604, <https://doi.org/10.1007/s11056-023-09980-y>.

⁶² Mufliah, N. The Importance of Geographical Indication Registration for Traditional Knowledge. *Journal of Law and Legal Reform*, 4(4), (2023):497-518. <https://doi.org/10.15294/jllr.v4i4.62083>

and sustainably, with technical assistance from responsible corporate partners. True partnership builds the economic dignity of rural people, rather than perpetuating capital dependence that limits local welfare. This relationship must be symbiotic.

The synthesis of this sustainable model is to create harmony between “Investment Certainty” and “Ecological Safety” in national development. Indonesia has the potential to be a global reference in sustainable tropical forest management through this comprehensive spatial planning legal reconstruction for a common, peaceful future.

Current legal needs are to place the “Principle of Sustainability” not as a secondary norm, but as a fundamental norm in a modern Indonesian green constitutional framework.⁶³ Revisions to Articles 17 and 18 of the Spatial Planning Law are needed to ensure that land-use criteria cannot be negotiated away to accommodate unregulated economic interests at the expense of the national ecosystem. The law must grant independent authorities the power to enforce administrative law immediately against spatial violations detected through transparent digital systems.

The global benefit of this legal reconstruction lies in creating a new standard in international environmental law that harmoniously bridges human rights and the rights of nature (biocentric law). The success of Indonesia in planning disaster-resilient HTI space will stabilize global cellulose commodity supplies while protecting the earth’s lungs from severe degradation, ensuring a sustainable future. In the future, this model will be Indonesia’s contribution to the global community in addressing climate crisis challenges through national legal sovereignty.

However, transitioning to this *ius constituendum* framework presents substantial practical implementation challenges. Immediate enforcement of all proposed reforms would likely face significant bureaucratic resistance, structural economic barriers, and opposition from entrenched industrial interests. Therefore, a phased and

⁶³ Daffa Ladro Kusworo and Fitra Arsil, “Green Constitutional Paradigm for Sustainable Environmental Development in the Capital of Archipelago: A Comparative Study with France and Ecuadorian Constitution,” *Unifikasi: Jurnal Ilmu Hukum* 11, no. 02 (2024): 83–98, <https://doi.org/10.25134/unifikasi.v11i02.769>.

prioritized approach is essential to make this proposed model actionable. The first phase should prioritize integrating transparent spatial monitoring (through the One Map Policy and GISTARU) and enforcing the “Mandatory Environmental Insurance” to establish immediate corporate accountability without requiring sweeping constitutional changes. The subsequent phase would involve the gradual institutionalization of the “Rights of Nature,” the redistribution of land rights to indigenous communities, and the establishment of the specialized environmental judiciary. This sequenced approach allows the legal system and industry stakeholders the necessary time to adapt to these transformative, ecocentric principles while securing early wins in disaster mitigation.

Conclusion

The legal policy reconstruction of Industrial Forest Plantation (HTI) spatial planning in Indonesia is an urgent necessity to overcome systemic failures in national disaster mitigation. Current legal frameworks prioritize extractive capital over environmental carrying capacities, facilitating “legal deforestation.” This paradigm directly escalates severe hydrological disasters, such as the 2025 Sumatra catastrophe, and deepens the socio-economic marginalization of indigenous communities.

To guarantee disaster mitigation and ecological justice, the future legal model (*ius constituendum*) must transition toward an inclusive ecocentrism that operationalizes the “Rights of Nature.” This necessitates a phased implementation of critical reforms: establishing the absolute supremacy of spatial plans over sectoral permits, enforcing mandatory ecological disaster risk insurance, and adopting highly transparent, geodata-driven spatial monitoring inspired by Nordic forestry governance. Ultimately, transforming spatial planning law from an instrument of corporate extraction into a shield of ecological defense is not merely an administrative shift, but a moral imperative to secure a sustainable, disaster-resilient, and globally just future for generations to come.

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