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Unraveling Green Extractivism: The Case of Nickel Downstreaming in the Indonesia Morowali Industrial Park

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Abstract

The global energy transition has increased demand for critical minerals used in electric vehicle batteries, positioning nickel as a strategic resource. In Indonesia, this demand is linked to a state-led downstreaming agenda centered on the Indonesia Morowali Industrial Park (IMIP), a major hub for nickel processing. This article examines how sustainability narratives are used to drive extractive expansion in IMIP. It adopts a qualitative single-case study design and uses a desk review of policy documents, corporate reports, gray literature, media sources, and academic studies from 2013 to 2025. The analysis is guided by Dunlap's framework of green extractivism. The findings show that IMIP reflects four interrelated features of green extractivism. Climate crisis and energy transition narratives are used to justify rapid industrial expansion. Extractive activities are legitimized through sustainability claims such as green development, ESG, and

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decarbonization. Downstreaming remains dependent on conventional extractivism, including upstream mining, land conversion, and coal-based energy systems. Sustainability is framed as a manageable technical issue, while socioecological impacts continue to accumulate, including environmental degradation, health risks, and livelihood disruption. This article contributes by extending the analysis of green extractivism beyond Latin America and by showing how it operates through a state-led downstreaming and industrial park model. It demonstrates that sustainability narratives can function as a justification for extractive expansion, raising concern about the conditions under which green industrialization can be aligned with meaningful environmental and social outcomes.

[Transisi energi global telah meningkatkan permintaan mineral penting yang digunakan dalam baterai kendaraan listrik, menempatkan nikel sebagai sumber daya strategis. Permintaan tersebut di Indonesia terkait dengan agenda hilir yang dipimpin negara yang berpusat pada Kawasan Industri Morowali Indonesia (IMIP), pusat utama pengolahan nikel. Artikel ini mengkaji bagaimana narasi keberlanjutan digunakan untuk mendorong ekspansi ekstraktif di IMIP. Artikel ini mengadopsi desain studi kasus tunggal kualitatif dan menggunakan tinjauan pustaka dari dokumen kebijakan, laporan perusahaan, terbitan kelabu (gray literature), sumber media, dan studi akademis dari tahun 2013 hingga 2025. Analisis ini dipandu oleh kerangka kerja ekstraktivisme hijau Dunlap. Temuan menunjukkan bahwa IMIP mencerminkan empat (4) fitur ekstraktivisme hijau yang saling terkait. Narasi krisis iklim dan transisi energi digunakan untuk membenarkan ekspansi industri yang cepat. Aktivitas ekstraktif dilegitimasi melalui klaim keberlanjutan seperti pembangunan hijau, ESG, dan dekarbonisasi. Hilirisasi tetap bergantung pada ekstraktivisme konvensional, termasuk penambangan hulu, konversi lahan, dan sistem energi berbasis batubara. Keberlanjutan dipandang sebagai isu teknis yang dapat dikelola, sementara dampak sosio-ekologis terus menumpuk, termasuk degradasi lingkungan, risiko kesehatan, dan gangguan mata pencaharian. Artikel ini berkontribusi dengan memperluas analisis ekstraktivisme hijau di luar Amerika Latin dan menunjukkan bagaimana hal itu beroperasi melalui model hilirisasi dan kawasan industri yang dipimpin negara. Artikel ini menunjukkan bahwa narasi keberlanjutan dapat berfungsi sebagai pembenaran untuk ekspansi ekstraktif, menimbulkan kekhawatiran tentang kondisi yakni industrialisasi hijau dapat diselaraskan dengan hasil lingkungan dan sosial yang bermakna.]

Keywords: green extractivism; nickel downstreaming; Indonesia Morowali Industrial Park (IMIP); sustainability

Introduction

Climate change mitigation and green development have become dominant policy goals in many countries. A major part of this agenda is the expansion of renewable energy systems and the electrification of transport, which rely on batteries and other energy storage technologies.[1] As a result, these changes have increased demand for minerals and metals used in electric vehicle batteries and related infrastructure. Hence, the global energy transition is driving the expansion of mining, processing, and industrial facilities across many resource-rich regions for gathering materials needed for sustainable vehicles and transportation.[2]

However, this situation raises a central tension. State policies and corporate strategies often present mineral extraction and industrial expansion as necessary steps toward sustainability.[3] At the same time, these activities can entail high environmental and social costs, particularly in regions with limited governance capacity and community protection.[4] Critical scholarship has responded to this tension by developing the concept of green extractivism.[5] Dunlap et al.

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[1] Sharmin Akther et al., 'Exploring the Influence of Green Growth and Energy Sources on "Carbon-Dioxide Emissions": Implications for Climate Change Mitigation', *Frontiers in Environmental Science* 12 (2024), https://doi.org/10.3389/fenvs.2024.1443915; Md Arif Hasan et al., 'The Synergy between Climate Change Policies and National Development Goals: Implications for Sustainability', *Journal of Cleaner Production* 249 (2019): 119369, https://doi.org/10.1016/j.jclepro.2019.119369.

[2] J L Calderon et al., 'Critical Mineral Demand Estimates for Low-Carbon Technologies: What Do They Tell Us and How Can They Evolve?', *Renewable and Sustainable Energy Reviews* 189 (2024): 113938, https://doi.org/10.1016/j.rser.2023.113938; Shiquan Dou et al., 'Critical Mineral Sustainable Supply: Challenges and Governance', *Futures* 146 (2023): 103101, https://doi.org/10.1016/j.futures.2023.103101.

[3] Christopher W Chagnon et al., 'From Extractivism to Global Extractivism: The Evolution of an Organizing Concept', *The Journal of Peasant Studies* 49, no. 4 (2022): 760–92, https://doi.org/10.1080/03066150.2022.2069015.

[4] Iva Peša and Corey Ross, 'Extractive Industries and the Environment: Production, Pollution, and Protest in Global History', *The Extractive Industries and Society* 8, no. 4 (2021): 100933, https://doi.org/10.1016/j.exis.2021.100933; Xiaoqi Zheng et al., 'Greenhouse Gas Emissions from Extractive Industries in a Globalized Era', *Journal of Environmental Management* 343 (2023): 118172, https://doi.org/10.1016/j.jenvman.2023.118172.

[5] Natacha Bruna, 'A Climate-Smart World and the Rise of Green Extractivism', *The Journal of Peasant Studies* 49, no. 4 (2022): 839–64, https://doi.org/10.1080/03066

define green extractivism in terms of two core features. First, socioecological and climate crises are used to create or reinforce markets and profit opportunities. Second, claims of sustainability or carbon neutrality are mobilized to legitimize and rationalize extraction.[6]

Moreover, research on green extractivism has expanded rapidly in recent years. A large share of this literature, however, remains rooted in Latin American debates on extractivism and its newer forms, as reflected in studies by Cabaña and Richter in Colombia and by Dorn et al. in Argentina.[7] As a result, the empirical reach of the concept remains unevenly distributed geographically. This concentration matters because it limits the understanding of how green extractivism operates across different political economies, regulatory settings, and industrial trajectories. In particular, there is still limited empirical work applying the green extractivism lens to other regions, especially in Southeast Asia, where critical mineral expansion is closely tied to resource nationalism, industrial policy, and global battery supply chains.

A second empirical gap concerns the form through which green extractivism unfolds. Existing studies have mostly examined extraction sites, renewable energy projects, or territorial conflicts surrounding resource frontiers.[8] Far less attention has been given to cases where green extractivism is organized through state-led downstreaming industrialization. This is an important omission because downstreaming

150.2022.2070482; Natacha Bruna, *The Rise of Green Extractivism* (Routledge PP - London, 2023), https://doi.org/10.4324/9781003351870; Alexander Dunlap, Judith Verweijen, and Carlos Tornel, 'The Political Ecologies of "Green" Extractivism(s): An Introduction ', *Journal of Political Ecology* 31, no. 1 (2024): 436–63, https://doi.org/10.2458/jpe.6131.

[6] Dunlap, Verweijen, and Tornel, 'The Political Ecologies of "Green" Extractivism(s): An Introduction '.

[7] Gabriela Cabaña and Katharina Richter, 'Green Extractivism in Colombia: A Scoping Review on Indigenous Rights and Livelihood Impacts, and Policy and Social Movement Responses', *The Extractive Industries and Society* 25 (2025): 101808, https://doi.org/10.1016/j.exis.2025.101808; Felix Malte Dorn, Robert Hafner, and Christina Plank, 'Towards a Climate Change Consensus: How Mining and Agriculture Legitimize Green Extractivism in Argentina', *The Extractive Industries and Society* 11 (2022): 101130, https://doi.org/10.1016/j.exis.2022.101130.

[8] Daniel Macmillen Voskoboynik and Diego Andreucci, 'Greening Extractivism: Environmental Discourses and Resource Governance in the "Lithium Triangle"', *Environment and Planning E: Nature and Space* 5, no. 2 (2021): 787–809, https://doi.org/10.1177/25148486211006345; Bruna, 'A Climate-Smart World and the Rise of Green Extractivism'.

does not simply intensify extraction. It also connects mining to smelting, energy provision, infrastructure expansion, labor reorganization, and state-backed legitimacy claims under the banner of green development. Hence, this article addresses both gaps by examining the nickel downstreaming in Indonesia through the case of the Indonesia Morowali Industrial Park in Central Sulawesi. By focusing on IMIP, this article shows how green extractivism operates beyond Latin America and through a state-led downstreaming model that links extractive expansion to industrial upgrading and energy transition narratives.

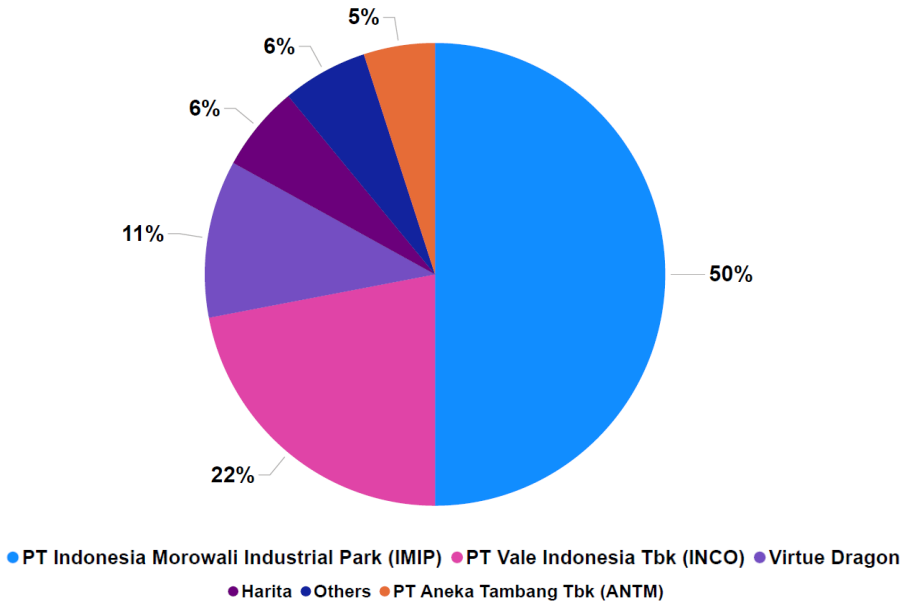

Figure 1. Share of Nickel Processing Company in Indonesia (2018)
Source: Umah[9]

Nickel downstreaming refers to the policy-driven shift from exporting raw nickel ore to building domestic processing and manufacturing capacity to capture more value within the country.[10] The

[9] Anisatul Umah, 'Bukan Vale atau Antam, Ini Dia Raja Nikel RI', *CNBC Indonesia* (cnbcindonesia.com, 2021), https://www.cnbcindonesia.com/news/20210917142525-4-277151/bukan-vale-atau-antam-ini-dia-raja-nikel-ri.

[10] Bahlil Lahadalia et al., 'Nickel Downstreaming in Indonesia: Reinventing Sustainable Industrial Policy and Developmental State in Building the EV Industry in

IMIP case is chosen because it has become a core hub for the nickel downstreaming strategy in Indonesia. IMIP is an integrated industrial area that processes nickel ore into intermediate products, including materials that support global electric vehicle supply chains.[11] It accounted for 50% of Indonesia's nickel production capacity in 2018 (Figure 1). Hence, IMIP has become the largest nickel processing industrial area in Indonesia.

Furthermore, to analyze the IMIP case through the lens of green extractivism, the article asks a research question: How does the Indonesian government use sustainability narratives to drive the expansion of extractive projects in the Indonesia Morowali Industrial Park? This article argues that the Indonesian government uses sustainability narratives to advance extractive expansion in the Indonesia Morowali Industrial Park through four interrelated dynamics. First, the crisis is framed as a business opportunity, with climate crisis and energy transition narratives used to justify rapid industrial expansion to capture growing global demand for nickel-based battery materials. Second, extractive expansion is legitimized through sustainability claims, as the government and corporate actors present IMIP as environmentally responsible through the language of ESG, CSR, green industry, and low-carbon development. Third, this project remains structurally entangled with conventional extractivism, as nickel downstreaming in IMIP continues to depend on coal-fired power, fossil-fuel-based industrial operations, and capital linked to older extractive sectors. Fourth, the project rests on a false assumption of renewability, because official sustainability narratives obscure the real socioecological consequences of expansion, including environmental degradation, social disruption, and worsening public health conditions around IMIP.

To address these questions, this article uses Dunlap's green extractivism framework as the primary analytical lens.[12] Dunlap's

ASEAN', *JAS (Journal of ASEAN Studies)* 12, no. 1 (2024): 79–106, https://doi.org/10.21512/jas.v12i1.11128.

[11] Angela Tritto and A Camba, 'State-Facilitated Industrial Parks in the Belt and Road Initiative: Towards a Framework for Understanding the Localization of the Chinese Development Model', *World Development Perspectives* 28 (2022): 100465, https://doi.org/10.1016/j.wdp.2022.100465.

[12] Dunlap, Verweijen, and Tornel, 'The Political Ecologies of "Green" Extractivism(s): An Introduction '.

framework is appropriate because it offers a clear set of features that distinguish green extractivism from conventional extractivism while also showing their deep connections. In his framework, Dunlap identifies four key features of green extractivism.[13] First, green extractivism uses crisis to expand markets. Dunlap conceptualizes green extractivism as leveraging socioecological, weather, and climate crises to generate new markets or reinforce existing "green" markets and profit opportunities. Hence, climate change becomes more than a policy problem. It becomes a justification and an enabling condition for investment, land control, and industrial expansion, presented as necessary for the transition. Second, green extractivism relies on sustainability claims to legitimize extraction. Dunlap's second feature emphasizes the mobilization of ecological sustainability, carbon neutrality, and climate mitigation claims to rationalize extractive operations. Therefore, projects can be framed as clean, renewable, or climate-friendly, even when their broader impacts remain severe. Dunlap also notes that these claims can encompass multiple practices, including carbon offsetting, energy-efficiency narratives, and "green" technology narratives.

Third, green extractivism is entwined with conventional extractivism. Dunlap stresses that green extractivism does not replace traditional extractivism. Instead, it depends on it and often expands it. Hence, "green" projects and "green" supply chains frequently require hydrocarbons, mining equipment, industrial infrastructure, and extensive processing capacities that reproduce conventional extractive relations. This is why a supply-web approach is essential: it reveals the material and institutional dependencies that are obscured when analysis focuses solely on the final "green" product. Fourth, green extractivism rests on false assumptions about renewability. Dunlap argues that green extractivism is sustained by assumptions that resources and ecological systems are renewable in ways that support continuous extraction. However, he warns that claims of renewability often obscure degradation, long-term damage, and exhaustion. Therefore, the category of "renewable" can function as a rhetorical device that conceals slow forms of harm and the cumulative impacts of industrial infrastructures.

[13] Dunlap, Verweijen, and Tornel.

Table 1. Operationalization of Concepts

Concept from Dunlap	**Case-focused Dimension (variable)**	**Operationalization for IMIP Case**
Green Extractivism	Crisis-based market expansion	Identify climate and transition urgency framing. Trace how it is used to justify faster investment, permitting, and industrial scaling in IMIP. Record the observable expansion outcomes and the key beneficiaries.
	Legitimacy through sustainability claims	Collect green development, decarbonization, and carbon neutrality claims used to frame downstreaming as responsible. Examine the tools used to support these claims, such as ESG reporting, AMDAL compliance narratives, and CSR communication. Compare claims with reported impacts.
	Structural entanglement with conventional extractivism	Document reliance on mining expansion and land conversion. Map enabling infrastructure and high-energy inputs for processing. Trace supply web dependencies, including logistics, labor arrangements, and state facilitation.
	Assumptions of renewability	Identify claims that impacts are manageable through mitigation, rehabilitation, offsets, or technology fixes. Assess evidence of cumulative and long-term harm, including waste, pollution, and health risks.

		Examine whether governance treats these risks as secondary to industrial goals.

Source: Author's Adoption from Dunlap[14]

The analytical framework is therefore operationalized by translating Dunlap's four features into four case-focused dimensions that guide the analysis of nickel downstreaming in the Indonesia Morowali Industrial Park (IMIP) (see Table 1). Hence, the further section is organised to assess whether IMIP reflects: (1) crisis-based market expansion, meaning the use of climate urgency and transition narratives to justify investment and industrial acceleration; (2) legitimacy through sustainability claims, meaning the use of green development, decarbonisation, and carbon neutrality narratives to present downstreaming as environmentally responsible; (3) structural entanglement with conventional extractivism, meaning dependence on mining expansion, land conversion, heavy industrial infrastructure, and high energy inputs that reproduce extractive relations; and (4) assumptions of renewability, meaning claims that industrial operations and resource use can be treated as sustainable or replenishable despite cumulative ecological degradation and long-term socioecological risks.

Methods

This study uses a qualitative approach and adopts a single-case study design.[15] This design is appropriate because the article seeks to explain how extractive expansion in the Indonesia Morowali Industrial Park (IMIP) is constructed, justified, and institutionalized through sustainability narratives. A single-case design is especially suitable because it allows the analysis to connect industrial policy, extractive restructuring, and green transition discourse within one bounded empirical setting. In substantive terms, IMIP is also a critical case. It

[14] Dunlap, Verweijen, and Tornel.
[15] Robert K Yin, *Case Study Research and Applications: Design and Methods*, 6th ed. (Sage Publications, Thousand Oaks, California, 2018).

concentrates large-scale nickel extraction, mineral processing, infrastructure expansion, labor reorganization, and transition-oriented narratives in one location, making it a strategically important site for examining how green extractivism operates through a state-led downstreaming model.

Furthermore, the study covers the period from 2013 to 2025. This time frame is selected for three reasons. First, 2013 marks the early establishment of IMIP and therefore provides the appropriate starting point for tracing the industrial park's emergence as a major nickel processing hub. Second, the period captures the consolidation of nickel downstreaming as part of Indonesia's resource nationalism and industrial policy agenda, including the intensification of export restrictions, smelter expansion, and state support for value-added processing. Third, the period includes the acceleration of global demand for electric vehicles and the battery supply chain, which is important because this broader transition context reshaped the strategic framing of nickel as a critical mineral for a low-carbon future.

The study uses desk review as its main data collection strategy. This approach is appropriate because many of the most relevant materials for analyzing IMIP are dispersed across policy documents, corporate publications, public statements, gray literature, environmental reports, news coverage, and scholarly work. Barbieri et al. define desk review as the systematic identification, selection, and analysis of documents that are often scattered across different repositories and are not always indexed in conventional academic databases.[16] They also emphasize that the process is iterative and adaptive, which closely aligns with this study, as evidence on IMIP must be assembled from regulatory documents, official publications, policy reports, civil society materials, and academic sources.

Accordingly, the dataset for this article consists of five broad categories of material. The first includes policy and legal documents, such as laws, regulations, ministerial rules, planning documents, and state policy materials related to downstreaming, industrial parks, mining governance, and environmental regulation. The second includes official institutional and corporate records, especially annual reports,

[16] Martina Barbieri et al., 'Desk Review as a Methodological Approach for Identifying Policies and Gray Literature: A Case Study', *Nursing Outlook* 73, no. 6 (2025): 102547, https://doi.org/10.1016/j.outlook.2025.102547.

sustainability reports, ESG-related publications, public presentations, and official statements from relevant state and corporate actors. The third includes gray literature, including working papers, policy briefs, NGO reports, advocacy reports, and independent assessments relevant to nickel industrialization, environmental change, labor conditions, and public health. The fourth includes secondary academic literature on green extractivism, Indonesian resource nationalism, Chinese investment, industrial parks, environmental governance, and the social and ecological consequences of nickel downstreaming. The fifth includes supporting documentary materials, such as maps, statistical records, media reports, and public communications, when these helped clarify the timeline of expansion, the scale of industrial development, or the contested narratives surrounding IMIP.

The inclusion and exclusion criteria were defined in relation to the research question. Included materials had to meet at least one of the following conditions: first, they addressed Indonesia's nickel downstreaming policy, the development of IMIP, or the political and industrial dynamics of the nickel sector; second, they discussed sustainability narratives, green transition discourse, or claims related to ESG, CSR, low-carbon development, or renewable energy transition in relation to nickel extraction and processing; third, they contained direct evidence on extraction, industrial processing, energy systems, labor conditions, infrastructure expansion, environmental degradation, public health, or community impacts connected to IMIP; fourth, they provided relevant contextual evidence on Indonesia's role in the global battery supply chain between 2013 and 2025. By contrast, materials were excluded when they fell outside the 2013 to 2025 time frame, lacked substantive relevance to IMIP or Indonesian nickel downstreaming, focused only on general energy transition issues without a meaningful connection to the case, or repeated information already available in more authoritative and detailed sources.

The desk review was conducted as a structured, yet iterative, process consisting of three interrelated stages: exploratory search, targeted search, and review and screening (see Figure 2). First, an exploratory search was conducted to map the documentary landscape of IMIP and Indonesian nickel downstreaming. At this stage, the aim was to identify the main institutions, recurring policy terms, key regulatory shifts, major industrial actors, and the principal repositories in which relevant documents were located. This stage helped establish

the importance of materials related to downstreaming policy, export restrictions, industrial park development, transition narratives, environmental controversies, and corporate legitimacy claims.

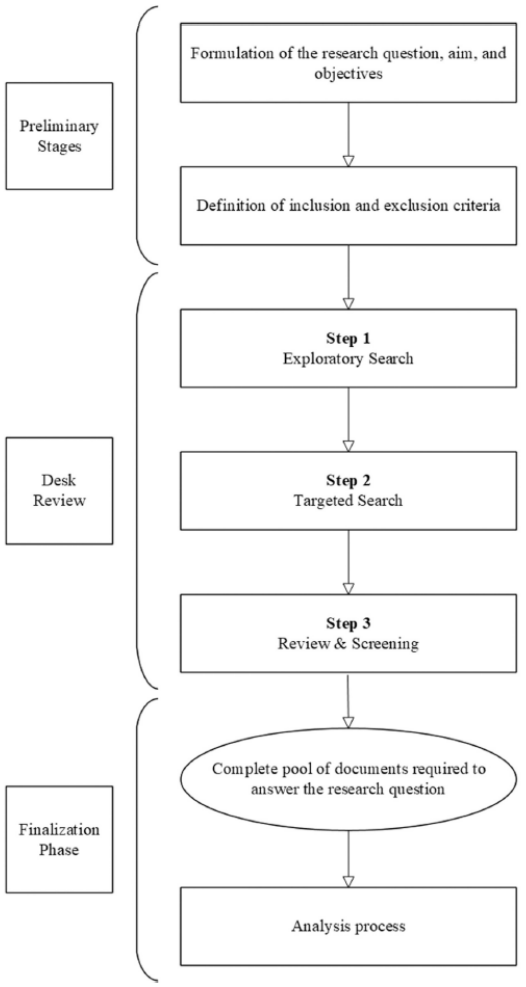

Figure 2**.** Stages for conducting a desk review
Source: Barbieri et al.[17]

Next, a more targeted search was undertaken using recurring keywords related to green extractivism, nickel downstreaming, IMIP, EV batteries, sustainability, ESG, CSR, coal power, environmental

[17] Barbieri et al.

governance, labor conditions, pollution, and Morowali. At this stage, materials were gathered from official government and institutional sources, company publications, policy and advocacy reports, academic studies, and credible media coverage. The collected documents were then organized into broad analytical clusters, namely: policy and governance materials, corporate and institutional narratives, socioecological impact materials, and scholarly and policy analysis. This clustering made it easier to distinguish between formal policy direction, official legitimacy claims, empirical evidence of impacts, and interpretive literature.

Furthermore, the collected materials were reviewed and screened more closely. This step involved checking whether each document contributed directly to the research question, whether it offered unique evidence, and whether it could be triangulated with other source types. Documents were added when cross-references revealed missing but relevant materials, and documents were excluded when closer reading showed limited thematic relevance or substantial duplication. To support traceability, the selected materials were cataloged in a structured database that recorded document type, year, issuing institution or author, thematic relevance, and analytical notes.

For the data analysis, the study uses thematic analysis following Braun and Clarke, operationalized through Byrne's worked example.[18] This method is appropriate because the article aims to identify and interpret recurring patterns of meaning across a body of documentary material rather than test a formal hypothesis through numerical indicators. Byrne emphasizes that thematic analysis treats coding and theme development as active, interpretive processes in which the researcher plays a central role in producing analytical meaning. This method is suitable for the present study because the article seeks to interpret how sustainability narratives are mobilized politically and institutionally to legitimize extractive expansion in IMIP.

[18] Virginia Braun and Victoria Clarke, 'Using Thematic Analysis in Psychology', *Qualitative Research in Psychology* 3, no. 2 (2006): 77–101, https://doi.org/10.1191/1478088706qp063oa; David Byrne, 'A Worked Example of Braun and Clarke's Approach to Reflexive Thematic Analysis', *Quality & Quantity* 56, no. 1 (2021): 1391–1412, https://doi.org/https://doi.org/10.1007/s11135-021-01182-y.

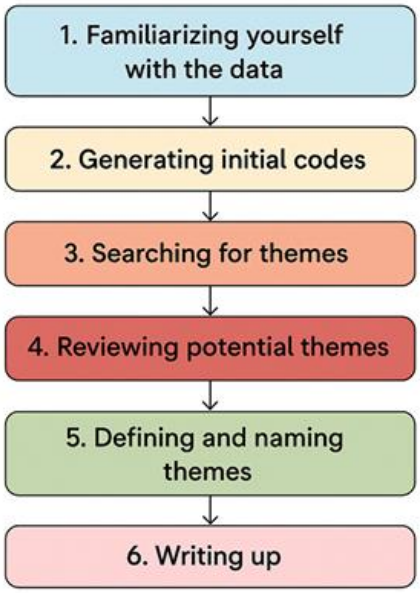

Figure 3. Process of Thematic Analysis
Source: Ahmed et al.[19]

In practical terms, the analysis followed Braun and Clarke's recursive six-phase process as summarized by Byrne (see Figure 3). First, the collected materials were read and reread to build familiarity with the dataset. Second, initial codes were generated across the documents, with attention to both explicit content and underlying meanings relevant to the research question. Third, related codes were grouped into candidate themes. Fourth, these themes were reviewed against the dataset as a whole to assess internal coherence and distinction from one another. Fifth, the themes were refined and clearly defined. Finally, the analysis was written up as an interpretive narrative that connected the themes back to Dunlap's framework and the broader literature on green extractivism.

Moreover, the coding process was predominantly theory-informed. Dunlap's framework of green extractivism guided attention to four central analytical dimensions: crisis as a business opportunity,

[19] Sirwan Khalid Ahmed et al., 'Using Thematic Analysis in Qualitative Research', *Journal of Medicine, Surgery, and Public Health* 6, no. 6 (2025): 100198, https://doi.org/https://doi.org/10.1016/j.glmedi.2025.100198.

legitimization through sustainability claims, entanglement with conventional extractivism, and the false assumption of renewability. These dimensions were translated into case-focused indicators to guide the analysis. The first dimension captured evidence showing how climate crisis, decarbonization, and energy transition narratives were used to justify rapid industrial expansion and to position IMIP as a strategic site for capturing value from rising global battery demand.

The second dimension captured sustainability-oriented claims, including references to green industry, low-carbon development, ESG, CSR, the clean energy transition, community empowerment, and other narratives that frame IMIP as socially and environmentally responsible. The third dimension captured evidence of IMIP's material dependence on conventional extractivism, including reliance on coal-fired power, fossil-fuel-based industrial operations, upstream mining expansion, land conversion, infrastructure build-out, and extractive capital linkages. The fourth dimension captured the contradiction between official sustainability narratives and documented socioecological harm, including pollution, environmental degradation, health risks, labor issues, and social disruption, which challenge the assumption that the system is renewable or environmentally manageable. In addition, the analysis remained open to emergent patterns that were not fully anticipated by the framework, especially regarding state resource nationalism, industrial park governance, and the role of Chinese investment.

Furthermore, to strengthen credibility, the study uses source triangulation across policy documents, official reports, company publications, gray literature, media materials, and secondary academic studies. It means that major claims were not based on a single document type alone. This triangulation strategy is important because documentary sources differ in purpose, tone, and degree of authority. It also helps reduce the risk of overreliance on official or corporate self-representations. When discrepancies emerged across sources, priority was given to formal legal and policy documents for matters of mandate, timing, and institutional direction. At the same time, peer-reviewed studies, NGO reports, and independent assessments were primarily used to evaluate socioecological impacts, governance gaps, and contested interpretations. This procedure supports transparency in how evidence was weighed and interpreted.

Results

Crisis-Based Market Expansion

The findings show that decarbonization agendas and the climate crisis are used to justify rapid expansion in Indonesia's nickel sector. Global transition narratives present the move toward low-carbon societies as dependent on a large increase in energy transition materials. Furthermore, nickel is repeatedly portrayed as a critical input for batteries powering renewable energy systems and electric vehicles. It is portrayed by President Joko Widodo's speech, which said: "*Green initiatives are being implemented across the globe. The electric vehicle battery industry has begun. We don't want to lose the opportunity to build an electric vehicle battery industry because we have the raw materials here. We have nickel, cobalt, and manganese*."[20] Furthermore, Luhut Pandjaitan, Indonesia's former Coordinating Minister for Maritime and Investment Affairs, also stated that Indonesia's competitiveness in refined nickel production, supported by its abundant coal supply, plays an important role in advancing the global energy transition and the development of electric vehicles.[21] As a result, expansion in nickel mining and processing is presented as time-sensitive and necessary for the broader transition.

This framing is thus reinforced through projections of electric vehicle growth and future nickel demand. For example, electric vehicles on the road are reported to have reached 16.5 million in 2022.[22] In addition, the International Energy Agency projects that nickel demand could increase by 47% to 210% between 2030 and 2040.[23] Then, long-term projections indicate a major shift in the vehicle market, with

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[20] Kementerian Lingkungan Hidup, 'Presiden Joko Widodo Ajak Masyarakat Jaga Kelestarian Lingkungan – Balai Kliring Keamanan Hayati', *Kemenlh.Go.Id*, 2023, https://balaikliringkehati.kemenlh.go.id/2023/09/18/presiden-joko-widodo-ajak-masyarakat-jaga-kelestarian-lingkungan/.

[21] Luhut Binsar Pandjaitan, 'Without Indonesia's Nickel, EVs Have No Future in America', *Foreign Policy*, 2024, https://foreignpolicy.com/2024/05/01/indonesia-nickel-green-energy-ev-fta-congress/.

[22] Imaduddin Abdullah and Andy Sumner, 'Linkage Development as Industrial Policy: The State and Structural Transformation in Resource-Rich Countries', *Working Paper Series*, 2025, https://doi.org/10.35188/unu-wider/2025/586-8.

[23] Pavel Boev, Barbara Kuepper, and Stefanie Geurts, 'The Destructive Indonesian Nickel Supply Chain', *Profundo.Nl* (Profundo, 2025), https://profundo.nl/projects/the-destructive-indonesian-nickel-supply-chain/.

estimates that electric vehicles could account for 58% of global vehicle sales by 2040.[24] Taken together, these figures support the expectation of sustained demand pressure for battery-related nickel.

At the same time, Indonesia's role is framed as strategically important within this global transition economy. Indonesia is positioned as a critical supplier because it is reported to hold around 42% to 52% of global nickel reserves.[25] This resource position is linked to a national upgrading agenda. In this agenda, downstreaming is presented as a shift away from low-value ore exports toward higher-value refined products, including stainless steel and materials for electric vehicle batteries.[26] As a result, transition urgency is translated into a development narrative that prioritizes speed, scale, and industrial deepening within Indonesia.

Moreover, policy design is closely aligned with this urgency. Law No. 4/2009 on minerals and coal mining, and its subsequent amendments, mandate domestic processing and refining. Moreover, a full ban on raw nickel ore exports took effect on 1 January 2020, with the stated intention of forcing investment into domestic smelting capacity.[27] In addition, the downstreaming agenda is linked to national priority mechanisms. IMIP is designated as both a National Strategic Project and a National Vital Object. As a result, project delivery is supported through permitting acceleration, streamlined land-acquisition processes, and fiscal incentives, such as tax holidays. Furthermore, the downstream push is integrated into the electric vehicle policy agenda through Presidential Regulation No. 55 of 2019, which is presented as accelerating the battery-based electric vehicle program and signaling long-term state support for battery material processing.

The expansion outcomes at IMIP reflect this acceleration pathway. IMIP is described as expanding from an initial greenfield site

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[24] Danyang Li and Wenying Chen, 'TIMES Modeling of the Large-Scale Popularization of Electric Vehicles under the Worldwide Prohibition of Liquid Vehicle Sales', *Applied Energy* 254 (2019): 113627, https://doi.org/10.1016/j.apenergy.2019.113627.

[25] Dwi Nugroho Sunuhadi et al., 'Availability of Indonesian Nickel Reserves and Efforts to Improve Reserves Resistance and Its Impact to Economic Growth', *Mineral Economics* 37, no. 3 (2024): 601–17, https://doi.org/10.1007/s13563-024-00443-0.

[26] Lahadalia et al., 'Nickel Downstreaming in Indonesia: Reinventing Sustainable Industrial Policy and Developmental State in Building the EV Industry in ASEAN'.

[27] Rizal Budi Santoso, Windy Dermawan, and Dwi Fauziansyah Moenardy, 'Indonesia's Rational Choice in the Nickel Ore Export Ban Policy', *Cogent Social Sciences* 10, no. 1 (2024), https://doi.org/10.1080/23311886.2024.2400222.

into a large industrial complex covering more than 2,000 to around 3,200 hectares.[28] Moreover, the park is reported to host between 11 and 20 smelters, including High-Pressure Acid Leach facilities designed to produce battery-grade nickel and cobalt.[29] In addition, IMIP reportedly has 52 operating tenants, including major producers of battery materials. Employment growth is also a key marker of scale, rising from around 43,000 workers in 2020 to around 80,000 by early 2024.[30] Alongside production facilities and labor expansion, infrastructure development is reported as part of the same scaling process. The developments include a private airport with a 1,800-meter runway, deep-sea ports with a reported capacity of 100,000 deadweight tons, and captive coal-fired power plants with a combined capacity of 1.9 to 4 gigawatts to supply the energy demands of processing.

Legitimacy Through Sustainability Claims

Nickel extraction and industrial park development around IMIP are increasingly framed through environmental and social priorities. In this framing, downstreaming is positioned as aligned with the Sustainable Development Goals and as a pathway to securing acceptance from international markets and domestic stakeholders. Legitimacy is built by linking IMIP and nickel downstreaming to the global clean energy transition and a low-carbon future. Within this narrative, nickel is described as a strategic transition material for

[28] Galih Wahyu Pradana, Sekar Ayu Kuncaravita, and Aldea Noor Alina, 'Policy and Impact Analysis of Smelter Development in Morowali Sulawesi: A Multidisciplinary Review of Social, Economic and Environmental Aspects', *East Asian Policy* 16, no. 04 (2024): 114–27, https://doi.org/10.1142/s1793930524000327.

[29] Angela Tritto, 'How Indonesia Used Chinese Industrial Investments to Turn Nickel into the New Gold', *Policycommons.Net*, 2023, https://policycommons.net/artifacts/3535290/how-indonesia-used-chinese-industrial-investments-to-turn-nickel-into-the-new-gold/4336593/.

[30] Pradana, Kuncaravita, and Alina, 'Policy and Impact Analysis of Smelter Development in Morowali Sulawesi: A Multidisciplinary Review of Social, Economic and Environmental Aspects'; Tritto and Camba, 'State-Facilitated Industrial Parks in the Belt and Road Initiative: Towards a Framework for Understanding the Localization of the Chinese Development Model'; Tritto, 'How Indonesia Used Chinese Industrial Investments to Turn Nickel into the New Gold'.

lithium-ion batteries used in electric vehicles.[31] In addition, terms such as green development, responsible mining, carbon neutrality, and circular economy are used to present downstreaming as compatible with expectations of the green economy.[32]

These legitimacy claims are reinforced through policies and corporate practices that signal responsibility and compliance. One channel is corporate social responsibility, where large CSR allocations are linked to community programs such as economic empowerment, basic infrastructure support, electricity assistance for nearby villages, and health services. PT IMIP has allocated significant funds for CSR, with reports citing an allocation of IDR 170 billion over three years (2022-2024).[33] Another channel is skills development, including the establishment of the Morowali Metal Industry Polytechnic as a platform for workforce training and technology transfer. In parallel, several firms associated with the nickel value chain publish ESG-oriented reporting to demonstrate performance and risk management.[34] Moreover, formal state backing, including IMIP's strategic project status, strengthens the public narrative that downstreaming is tied to national prosperity and long-term development priorities.

At the same time, legitimacy is challenged by recurring labor, safety, and environmental disputes across the evidence base. On labor and safety, recurring concerns include weak occupational standards, fatal accidents, and workplace conflict over wage inequality, overtime, and worker treatment, including passport confiscation claims. A major reference point is the December 2023 explosion at PT ITSS that killed

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[31] Trissia Wijaya and Lian Sinclair, 'An EV-Fix for Indonesia: The Green Development-Resource Nationalist Nexus', *Environmental Politics* 34, no. 2 (2024): 1–23, https://doi.org/10.1080/09644016.2024.2332129.

[32] Nicholas Bainton et al., 'The Energy-extractives Nexus and the Just Transition', *Sustainable Development* 29, no. 4 (2021): 624–34, https://doi.org/10.1002/sd.2163; Elizabeth Thurbon et al., *Developmental Environmentalism: State Ambition and Creative Destruction in East Asia's Green Energy Transition* (Oxford University Press, 2023).

[33] Naufal Alfaruqi Masyam et al., 'CSR Implementation Program of PT. IMIP on Economic Empowerment and Environmental Sustainability of The Surrounding Community', *Golden Ratio of Social Science and Education* 5, no. 2 (2025): 444–52, https://doi.org/10.52970/grsse.v5i2.1358.

[34] Tritto and Camba, 'State-Facilitated Industrial Parks in the Belt and Road Initiative: Towards a Framework for Understanding the Localization of the Chinese Development Model'.

21 workers, which intensified scrutiny of safety governance in the park area.[35] On environmental and livelihood issues, civil society mobilization is strongly associated with opposition to deep-sea tailings disposal, with organizations such as JATAM and WALHI driving public pressure and leading to permit withdrawals.[36] In addition, Greenpeace and Transparency International are cited in broader critiques that describe the nickel industry as ecologically destructive and shaped by opaque governance practices.[37]

Table 2. The Contradicting Reality of Legitimacy Claim with the Actual Condition of IMIP

Legitimacy Claim	**Reported Condition / Impact**
Nickel is the cornerstone of the renewable energy future.	IMIP relies on 1.9 to 4 GW of captive coal-fired power plants, which have significantly increased CO2 emissions in the region since 2020 (tripled from approximately 15 million tons in 2020 to nearly 50 million tons by 2023).[38]
Job creation (80,000 workers) and regional economic growth	High GDP leakage from the region; locals often hold low-wage, manual roles, while managerial positions are dominated by expatriates. In 2020, Morowali's GRDP grew by 28.74%, while household consumption grew by only 1.26%. In 2022, GRDP grew by

[35] Boev, Kuepper, and Geurts, 'The Destructive Indonesian Nickel Supply Chain'.
[36] Muhammad Rushdi et al., 'Rangkaian Pasok Nikel Baterai dari Indonesia dan Persoalan Sosial Ekologi' (Aksi Ekologi & Emansipasi Rakyat, 2020), https://www.aeer.or.id/wp-content/uploads/2024/11/Nikel-baterai-2021_compressed.pdf.
[37] Farah Rosada, 'Reforming Environmental Governance in Response to Indonesia's Nickel Industrial Policy: A Critical Assessment of Sustainability Challenges', *Global: Jurnal Politik Internasional* 27, no. 1 (2025), https://doi.org/10.7454/global.v27i1.1377.
[38] Abdullah and Sumner, 'Linkage Development as Industrial Policy: The State and Structural Transformation in Resource-Rich Countries'; Tritto, 'How Indonesia Used Chinese Industrial Investments to Turn Nickel into the New Gold'; Arianto Sangadji, 'HPAL: A New Challenge for the Environment in Indonesia' (The Action for Ecology and People Emancipation (AEER), 2024), https://www.aeer.or.id/en/hpal-a-new-challenge-for-the-environment-in-indonesia/.

	28.4%, while household consumption grew by only 3.62%.[39]
CSR projects for mangrove planting and waste management. From 2017 to 2023, IMIP planted more than 100,000 mangrove seedlings along the Bahodopi coast.[40]	24,811 hectares of forest cleared for nickel over 20 years. Widespread water pollution (red mud). Drastic declines in fisheries are attributed to large deposits of other waste, tailings, and mining residues in local waterways.[41]
Provision of free clinics and hospital facilities (Since 2014, the company has covered community treatment costs through the Permata Indah Main Clinic (KUPI)).[42]	ISPA (Acute Respiratory Infection) cases in Bahodopi surged from 13,081 in 2022 to 55,527 in 2023 due to coal and mining dust.[43]
Rule of Law & Compliance. Reference to environmental laws and AMDAL procedures.	74% of affected residents report never being included in public consultations; audits find companies violating emission standards without sanctions.[44]

Source: Author's Compilation

[39] Abdullah and Sumner, 'Linkage Development as Industrial Policy: The State and Structural Transformation in Resource-Rich Countries'.
[40] Masyam et al., 'CSR Implementation Program of PT. IMIP on Economic Empowerment and Environmental Sustainability of The Surrounding Community'.
[41] Nanang Indra Kurniawan, Poppy Sulistyaning Winanti, and Devy Dhian Cahyati, 'Recarbonization Through Decarbonization: Nickel Extraction and the Deepening of Fossil Fuel Dependence in Indonesia', *Global Environmental Politics* 25, no. 3 (2025): 1–21, https://doi.org/10.1162/glep.a.12.
[42] Masyam et al., 'CSR Implementation Program of PT. IMIP on Economic Empowerment and Environmental Sustainability of The Surrounding Community'.
[43] Boev, Kuepper, and Geurts, 'The Destructive Indonesian Nickel Supply Chain'.
[44] Adam Kurniawan et al., 'Melanjutkan Tersesat, atau Kembali ke Jalan yang Benar' (Wahana Lingkungan Hidup Indonesia, 2025), https://www.walhi.or.id/ melanjutkan-tersesat-atau-kembali-ke-jalan-yang-benar; Tegar Raffi and Muhammad Fadirah Fauzi, 'Intersection Between Administrative Freies Ermessen and Maladministration in Strategic Nickel Industrial Area Development in Morowali', *Ius Comparatum: Journal of Law Studies* 1, no. 2 (2025): 39–58, https://doi.org/10.35586/icjls.v1i2.12028.

Figure 4. Bahodopi coastal waters are contaminated with red soil
Source: Rushdi et al.[45]

Finally, the sustainability narrative coexists with persistent reporting of environmental, social, and governance problems (see Table 2 and Figure 4). Decarbonization language is paired with continued reliance on captive coal-fired power and related emission concerns around IMIP. Development claims around employment and regional growth are paired with concerns about inequality, including the concentration of higher positions among expatriates and limited benefits for local workers. Furthermore, CSR-based environmental stewardship claims coexist with reports of extensive forest clearance, red-mud water pollution, and mangrove damage. In addition, public health support narratives through clinics and hospitals appear alongside reported increases in respiratory illness in Bahodopi from 2022 to 2023, linked to exposure to coal and mining dust. Furthermore, compliance narratives, including reference to environmental assessment procedures, coexist with reported governance gaps such as limited public consultation and weak enforcement when emission standards are violated.

Structural Entanglement with Conventional Extractivism

A central finding is that IMIP's positioning within the global energy transition is enabled by conventional extractive relations and heavy industrial systems. The downstreaming agenda depends on continuous upstream extraction growth. This dependence is reinforced

[45] Rushdi et al., 'Rangkaian Pasok Nikel Baterai dari Indonesia dan Persoalan Sosial Ekologi'.

through land conversion and spatial restructuring in Bahodopi. Then, industrial operations are sustained by fossil fuels, especially captive coal-fired power. Moreover, the park's scale relies on a self-contained infrastructure and logistics ecosystem. Additionally, high-output processing is maintained through a labor regime marked by segmentation, long working hours, and elevated workplace risk.

IMIP's processing capacity is closely tied to rapid upstream nickel extraction across Sulawesi and Maluku. As mentioned earlier, Indonesia is regularly positioned as a major global supplier because it is reported to hold roughly 23.7% to 42% of global nickel reserves.[46] This resource position is translated into a supply expansion pathway. Over the past decade, extraction rates have been reported to have increased sharply, including a reported fourteen-fold rise, with national production rising from around 130,000 metric tons in 2015 to around 1.8 million metric tons by 2023.[47] In parallel, ore supply for IMIP is linked to specific mining operations, including PT Bintang Delapan Mineral and the Hengjaya Nickel Mine.[48] Moreover, the park functions as a dominant buyer for domestic miners. More than 67 domestic mining companies are described as dependent on domestic processing hubs because export routes for raw ore are closed.[49] As a result, the 2020 export ban locks national ore supply into domestic industrial facilities and strengthens the park's position in the supply chain.

Furthermore, industrial expansion is accompanied by land conversion and wide spatial restructuring in Bahodopi. The park footprint is reported to be between 2,000 and 3,000 hectares, while broader plans suggest expansion to up to 5,500 hectares.[50] In practice, this scale is associated with the conversion of forest areas, including both limited-production forests and permanent-production forests. For example, forest cover in Bahodopi is reported to have declined by more than 440 hectares between 2019 and 2022 to accommodate mining and

[46] Sunuhadi et al., 'Availability of Indonesian Nickel Reserves and Efforts to Improve Reserves Resistance and Its Impact to Economic Growth'.
[47] Statista, 'Indonesia Nickel Mine Production 2021', *Statista*, 2025, https://www.statista.com/statistics/260757/indonesian-mine-production-of-nickel-since-2006/.
[48] Boev, Kuepper, and Geurts, 'The Destructive Indonesian Nickel Supply Chain'.
[49] Tritto and Camba, 'State-Facilitated Industrial Parks in the Belt and Road Initiative: Towards a Framework for Understanding the Localization of the Chinese Development Model'.
[50] Boev, Kuepper, and Geurts, 'The Destructive Indonesian Nickel Supply Chain'.

infrastructure.[51] In addition, the shift in land use is linked to livelihood disruption. Agricultural activities such as rice farming and cocoa cultivation are described as being displaced as land is converted for industrial facilities, offices, an airport, and worker housing. Coastal livelihoods are also reported to be affected. Fishermen report reduced catches, linked to sedimentation associated with loading docks and hot wastewater discharge from power plants.[52]

Then, the energy system sustaining IMIP reinforces the link to conventional extractivism. Processing laterite nickel ore requires high and stable energy input, and HPAL processing for battery materials further increases this need because it requires a constant baseload of electricity and high heat.[53] In this context, IMIP relies on off-grid captive coal-fired power plants built specifically to run the smelting and processing system. Captive coal capacity is reported at around 4,000 megawatts.[54] As a result, the "green" positioning of battery minerals coexists with a coal-powered industrial base. This reliance is also linked to rising emissions. CO_2 emissions from coal plants in Indonesian nickel-producing regions are reported to have reached around 50 million tons annually by 2023.[55] In addition, health-related projections describe future burdens, including estimates of thousands of respiratory-related deaths by 2030 linked to smelters and captive coal plants in Central Sulawesi.[56]

In addition, IMIP's growth is enabled by heavy infrastructure and logistics build-out that connects a remote region to global markets. The industrial core includes 11 to 20 smelters using both

[51] Miftahul Jannah Nasution et al., 'The Impact of Increasing Nickel Production on Forest and Environment in Indonesia: A Review', *Jurnal Sylva Lestari* 12, no. 3 (2024): 549–79, https://doi.org/10.23960/jsl.v12i3.847.
[52] Rushdi et al., 'Rangkaian Pasok Nikel Baterai dari Indonesia dan Persoalan Sosial Ekologi'.
[53] Rushdi et al.
[54] Arianto Sangadji and Pius Ginting, 'Multinational Corporations and Nickel Downstreaming in Indonesia', *Aeer.or.Id*, 2022, https://www.aeer.or.id/en/multinational-corporations-and-nickel-downstreaming-in-indonesia/.
[55] Abdullah and Sumner, 'Linkage Development as Industrial Policy: The State and Structural Transformation in Resource-Rich Countries'; Tritto, 'How Indonesia Used Chinese Industrial Investments to Turn Nickel into the New Gold'.
[56] Boev, Kuepper, and Geurts, 'The Destructive Indonesian Nickel Supply Chain'.

pyrometallurgical and hydrometallurgical technologies.[57] Alongside this, transport infrastructure includes a port facility reported as capable of handling 100,000 tons deadweight, an airport with a 1,800-meter runway, and an internal road network designed for ore movement and export logistics.[58] Supporting services are also described as part of the park model. These include a dedicated telecommunications network, including underwater cables linked to Chinese satellite systems, as well as on-site hotels, clinics, and the Morowali metal industry polytechnic to serve the industrial workforce and operational needs.[59]

Finally, IMIP's operational model is sustained through labor arrangements that enable continuous production. Workforce segmentation is described as a structural feature, with around 5,000 to 6,000 Chinese expatriates holding managerial and technical roles. At the same time, the majority of the 35,000 to 80,000 Indonesian workers occupy lower-skilled and lower-paid positions.[60] Wage gaps are described as significant, with claims that Chinese workers earn four to five times as much as Indonesian workers in comparable settings.[61] In addition, demanding working hours are reported as routine, with shifts extending from 8 to 12 hours to maintain 24-hour production cycles.[62]

Assumptions of Renewability

A central finding is that nickel industrialization is often framed as a manageable technical challenge within the global energy transition. At the same time, long-term environmental and social risks continue to accumulate beyond the capacity of current governance. Sustainability

[57] Septa Dinata et al., 'The Outcome of China's Investment in Indonesia: Lessons from the Nickel Industry' (Paramadina Public Policy Institute, 2020).
[58] Tritto, 'How Indonesia Used Chinese Industrial Investments to Turn Nickel into the New Gold'.
[59] Alvin Camba, Guanie Lim, and Kevin Gallagher, 'Leading Sector and Dual Economy: How Indonesia and Malaysia Mobilised Chinese Capital in Mineral Processing', *Third World Quarterly* 43 (2022): 1–21, https://doi.org/10.1080/01436597.2022.2093180.
[60] Sangadji and Ginting, 'Multinational Corporations and Nickel Downstreaming in Indonesia'; Tritto and Camba, 'State-Facilitated Industrial Parks in the Belt and Road Initiative: Towards a Framework for Understanding the Localization of the Chinese Development Model'.
[61] Boev, Kuepper, and Geurts, 'The Destructive Indonesian Nickel Supply Chain'.
[62] Dinata et al., 'The Outcome of China's Investment in Indonesia: Lessons from the Nickel Industry'.

is presented as achievable through mitigation tools, rehabilitation programs, and technology upgrades. Further on, the same development pathway generates waste streams and ecological pressures that create long-duration risks. Then, community health burdens and livelihood disruptions persist as difficult-to-reverse outcomes. Eventually, governance responses tend to prioritize procedural compliance and short-term macroeconomic goals, which shifts long-term risks into the background.

Mitigation and management claims are used to present industrial impacts as controllable. In this framing, emission controls are addressed through technical integration. For example, PT IMIP is described as implementing flue gas desulfurization, wet scrubbers, and electrostatic precipitators.[63] In addition, operational upgrades are linked to climate narratives, such as commitments to use electric wheel loaders, which are claimed to reduce CO_2 emissions by around 3,000 tons annually, and are framed as equivalent to planting around 8,000 trees.[64] Rehabilitation is also presented through CSR programs, including claims of planting 100,000 mangrove seedlings along the Bahodopi coast between 2017 and 2023, planting 5,000 shade trees, and rehabilitating around 30 hectares of mangrove land as a climate-related response.[65] Moreover, efficiency narratives are used to signal progress, including claims that IMIP's processing methods are approximately 25% more efficient and more environmentally friendly than earlier smelting operations. In parallel, carbon emissions could be reduced by 15% to 20% through strategies such as waste heat recovery and fleet electrification.[66] Taken together, these claims frame sustainability as a technical matter of controls, upgrades, and better management.

Waste and tailings governance also reveals a different kind of sustainability problem, where the main challenge is the volume and

[63] Alifah Risa Naprida et al., 'Polusi Udara di Kawasan Industri Nikel di Morowali: Dampak, Resiko, dan Solusi Mitigasi', *Al-Ard: Jurnal Teknik Lingkungan* 11, no. 1 (2025): 26–32, https://doi.org/10.29080/alard.v11i1.2220.
[64] Naprida et al.
[65] Naprida et al.
[66] Dedy Setyo Oetomo, Asep Hermawan, and Hendi Iskandar, 'Carbon Footprint Optimization in Nickel-Based Industrial Development: A Case Study of IMIP Morowali Through Sustainable Supply Chain Management Approach', *Journal of Information System, Technology and Engineering* 3, no. 1 (2025): 422–27, https://doi.org/10.61487/jiste.v3i1.131.

long-term persistence of industrial waste. A central controversy concerns tailings from High Pressure Acid Leaching, which can generate very large annual waste volumes, with figures reported up to 25 million tons per year.[67] In this context, Deep Sea Tailings Placement was initially proposed in Morowali and Obi Island as a disposal method.[68] Proponents argue that it reduces acid-mine-drainage risks by placing tailings in stable, deep-ocean layers. However, strong opposition has come from civil society groups such as JATAM and from fishing communities, who link DSTP to the risk of upwelling that could return toxic tailings to the surface and damage marine biodiversity.[69] This contestation has also shaped governance outcomes. For example, social pressure and the absence of space for sea disposal in regional coastal spatial plans led companies such as PT Hua Pioneer to cancel DSTP permit applications in late 2020 and shift toward land-based disposal options.[70] At the same time, regulatory ambiguity remains, since some rules still allow future sub-sea disposal under certain conditions. As a result, the waste issue remains unresolved in the long term, even when short-term decisions change.

Then, evidence of cumulative ecological change suggests that degradation continues despite mitigation narratives. Coastal and water transformation is a recurring theme. Near-shore waters are described as shifting from clear blue to a "Yellow Sea," linked to sedimentation and runoff from upstream mining and industrial construction.[71] In addition, measured heavy metal contamination in coastal sediments, including cadmium, nickel, tin, and lead, is reported to reach high severity levels

[67] Ilyas Lampe et al., 'Environmental Communication Strategy against Deep-Sea Tailings Disposal in Morowali', *Jurnal Manajemen Komunikasi* 8, no. 2 (2024): 242–65, https://doi.org/10.24198/jmk.v8i2.49527.
[68] Rushdi et al., 'Rangkaian Pasok Nikel Baterai Dari Indonesia Dan Persoalan Sosial Ekologi'.
[69] Rushdi et al.
[70] Tritto, 'How Indonesia Used Chinese Industrial Investments to Turn Nickel into the New Gold'.
[71] Abdul Kadir, Eka Suaib, and La Husen Zuada, 'Mining in Southeast Sulawesi and Central Sulawesi: Shadow Economy and Environmental Damage Regional Autonomy Era in Indonesia', *Proceedings of the International Conference on Social Studies and Environmental Issues (ICOSSEI 2019)*, 2020, https://doi.org/10.2991/assehr.k.200214.004.

at some sampling locations.[72] Land-based transformation is also described at a broader scale. Satellite-based reporting describes a large expansion in the nickel mine area, including an increase of more than 700% between 2001 and 2020.[73] This expansion is linked to river modifications, including closures and relocations, which are described as worsening floods and landslides that damage housing and local infrastructure. Moreover, coastal ecosystem impacts are described as cumulative, including reports of approximately 13 kilometers of damaged coastline, coral reef mortality, and mangrove loss that affect small-scale coastal livelihoods, such as crab cultivation.[74] These patterns describe slow, compounding damage that challenges the assumption that industrial impacts remain manageable within current control systems.

Finally, governance treatment of long-term risks tends to prioritize short-term delivery and procedural formalism. Environmental Impact Assessment processes are frequently described as functioning as a formality rather than a binding safeguard.[75] Construction is reported to sometimes begin before permits are fully approved, and many AMDAL documents are described as not fully accessible to the public.[76] In addition, the designation of IMIP as a National Strategic Project is associated with operational privileges, including faster permitting and reduced oversight pressure justified through efficiency and national priority. As a result, risk management often becomes reactive, responding to public pressure after controversies rather than building preventive governance that can manage long-term degradation. At the same time, the benefits of the boom are described

[72] Yani Taufik, Sarlan Adijaya, and Iskandar Zainuddin Rela, 'Nickel Smelter on Social-Economics and Environmental Issues', 2022, https://doi.org/10.21203/rs.3.rs-2232605/v1.

[73] Wouter Heijlen and Chris Duhayon, 'An Empirical Estimate of the Land Footprint of Nickel from Laterite Mining in Indonesia', *The Extractive Industries and Society* 17 (2024): 101421, https://doi.org/10.1016/j.exis.2024.101421.

[74] Taufik, Adijaya, and Rela, 'Nickel Smelter on Social-Economics and Environmental Issues'.

[75] Nafoura Maharani Arl and Sang Ayu, 'Foreign Direct Investment dalam Skema Joint Venture: Analisis Dampak Sosial-Ekologis di Kawasan Industri Morowali', *Jurnal Ilmiah Nusantara* 2, no. 3 (2025): 802–10, https://doi.org/10.61722/jinu.v2i3.4636.

[76] Raffi and Fauzi, 'Intersection Between Administrative Freies Ermessen and Maladministration in Strategic Nickel Industrial Area Development in Morowali'.

as unevenly retained, with claims of high GDP leakage when profits are repatriated rather than reinvested in social and environmental repair. This combination of accelerated governance and limited reinvestment reinforces an assumption that long-term damage can be deferred, even as evidence of cumulative ecological and social risk continues to grow.

Discussion

IMIP and the Broader Contradictions of Sustainability

Across the four dimensions of Dunlap's framework, IMIP reflects the full green extractivism package because the downstreaming agenda combines all four features in a mutually reinforcing way. These four features operate as a single assemblage rather than separate dynamics. Transition urgency enables acceleration and reduces hesitation. Acceleration increases the scale of extraction, energy demand, and waste flows. These material consequences intensify contestation, thereby increasing the need for sustainability claims and responsibility instruments to stabilize legitimacy. In turn, legitimacy work supports continued expansion, even as cumulative risks are deferred. As a result, IMIP illustrates how green extractivism is reproduced through the interaction of crisis framing, legitimacy practices, conventional extractive dependency, and governance that treats long-term harm as secondary to industrial growth.

Moreover, the case of green extractivism in IMIP carries broader implications for Indonesia's position in the global electric vehicle and battery supply chain. On the one hand, IMIP strengthens Indonesia's role as a strategic supplier of processed nickel and gives the state a stronger position in global discussions on critical minerals, industrial upgrading, and downstream value capture. In this sense, downstreaming enables Indonesia to move beyond its role as a raw materials exporter and present itself as an important actor in the emerging green economy. On the other hand, the findings suggest that this upgraded position remains deeply contradictory. The sustainability narratives surrounding IMIP do not primarily function as a pathway toward substantive ecological transformation. Instead, they work more effectively as a political and developmental justification for accelerating extractive expansion. As a result, Indonesia's stronger position in the green supply chain is built through an industrial model

that continues to generate environmental degradation, social disruption, and dependence on carbon-intensive energy systems.

This contradiction places Indonesia at a difficult crossroads. If the country seeks to become a central actor in sustainability-related sectors, the legitimacy of that position cannot rest on discourse alone. It must also be reflected in the actual organization of production. The evidence from IMIP shows that the current model does not yet resolve the tension between industrial growth and ecological protection. Rather, it externalizes many of the social and environmental costs of the global energy transition onto local production zones such as Morowali. It means that Indonesia's participation in the EV supply chain is not simply a story of successful industrial upgrading. It is also a story of how global demand for "green" materials can reproduce unequal environmental burdens in resource-rich regions. In this respect, the article suggests that Indonesia's future role in the global supply chain will depend not only on its capacity to attract investment and expand processing, but also on whether it can align industrial policy with meaningful environmental governance, stronger labor protections, and less carbon-intensive energy systems.

More broadly, the IMIP case also raises an important implication for debates on green development in further Global South studies. The findings do not suggest that green development is impossible in principle. However, they do show that it becomes deeply problematic when sustainability is treated mainly as a narrative framework for legitimizing extractive industrialization rather than as a substantive basis for reorganizing production. In other words, green development in resource-rich developing countries cannot be reduced to inserting climate language, EV ambition, or low-carbon branding into national industrial agendas. Without structural changes in energy use, environmental governance, labor conditions, and community protection, the green label risks functioning mainly as a new justification for expanding old extractive practices. Under these conditions, what appears as green development may instead reproduce a familiar pattern in which resource frontiers are intensified, ecological harm is displaced, and local communities absorb the costs of a transition whose benefits are distributed elsewhere.

The broader lesson from IMIP, therefore, is that participation in the global green economy is not automatically transformative. It can reproduce extractive logics unless industrialization is accompanied by

deeper structural changes in how value is produced, how harm is regulated, and how sustainability is defined in practice. For Indonesia, this means that becoming a major hub in the battery supply chain will not by itself secure a sustainable development pathway. That outcome depends on whether the state is willing to move beyond mere narrative commitments and impose material changes in the organization of extraction, energy, labor, and environmental protection.

What the IMIP Case Adds to Green Extractivism Studies

This study contributes to green extractivism research in three related ways. It extends the empirical scope of the literature beyond the Latin American cases that have shaped many of the field's early debates. Studies such as Dorn et al., Andreucci et al., and Voskoboynik and Andreucci have shown how green extractivism operates through territorial dispossession, sustainability discourse, and state-corporate alliances in Latin America.[77] The IMIP case shows that similar dynamics also operate in Southeast Asia, but through a different political-economic configuration. In Indonesia, green extractivism is not only tied to extraction frontiers. It is also embedded in a state-led downstreaming agenda that links resource nationalism, industrial upgrading, and global battery supply chains. It broadens the concept by showing that green extractivism can be organized not only around the opening of new extractive territories, but also around the transformation of resource-rich states into processing hubs within the global green economy.

Furthermore, the IMIP case suggests that green extractivism should be understood not only as a discourse of legitimation but also as a mode of industrial governance. In Dunlap's framework, crisis narratives, sustainability claims, and extractive expansion are deeply connected. The Indonesian case confirms this connection, but it also shows that these dynamics are institutionally stabilized through downstreaming policy, export bans, National Strategic Project

[77] Dorn, Hafner, and Plank, 'Towards a Climate Change Consensus: How Mining and Agriculture Legitimize Green Extractivism in Argentina'; Diego Andreucci et al., 'The Coloniality of Green Extractivism: Unearthing Decarbonisation by Dispossession through the Case of Nickel', *Political Geography* 107, no. 107 (2023): 102997, https://doi.org/10.1016/j.polgeo.2023.102997; Voskoboynik and Andreucci, 'Greening Extractivism: Environmental Discourses and Resource Governance in the "Lithium Triangle"'.

designation, and industrial park administration. In other words, green extractivism in IMIP is not sustained by discourse alone. It is reinforced by a state project that actively reorganizes regulation, land use, infrastructure provision, and investment incentives in order to accelerate extractive-industrial growth. This adds a new layer to the conceptual framework by showing how green extractivism can be governed through industrial policy instruments that present extraction as national upgrading rather than mere resource exploitation.

Moreover, the IMIP case highlights the importance of analyzing green extractivism through the interaction between resource nationalism and transnational capital. At first glance, Indonesia's downstreaming agenda appears to strengthen national control over natural resources by restricting the export of raw ore and promoting domestic processing. However, the case also shows that this apparent assertion of sovereignty is deeply entangled with foreign capital, especially Chinese investment, technology, and market access[78]. This creates a more complex configuration than one in which national governments simply facilitate foreign extraction. In IMIP, the state seeks to capture more value domestically and to reposition Indonesia within the battery supply chain. However, this repositioning remains dependent on external capital and external industrial demand. The theoretical implication is important. Green extractivism may operate through projects that appear nationalist and developmentalist on the surface, while still reproducing new forms of dependence within global production networks. In that sense, the Indonesian case shows that green extractivism can take the form of a nationalist-developmental project that is simultaneously dependent on transnational capital.

It also helps refine the understanding of legitimacy in green extractivism. In many accounts, legitimacy is built through environmental discourse and promises of sustainable development. In IMIP, legitimacy is also built through the language of national pride, industrial modernity, and sovereign upgrading. Nickel downstreaming is framed not only as a contribution to global decarbonization but also as proof that Indonesia can move up the value chain and avoid remaining a raw material exporter. It means that the legitimacy of green

[78] Dinata et al., 'The Outcome of China's Investment in Indonesia: Lessons from the Nickel Industry'; Sangadji and Ginting, 'Multinational Corporations and Nickel Downstreaming in Indonesia'.

extractivism in Indonesia rests on a dual narrative. It aligns with global sustainability goals while also appealing to domestic political aspirations for development, sovereignty, and industrial transformation. This dual structure of legitimacy adds an important nuance to the theory by showing that green extractivism may be justified not only through ecological claims but also through nationalist-developmentalist promises.

The IMIP case also pushes the study of green extractivism beyond mine-centered analysis. It shows that green extractivism can be organized through an industrial park model that concentrates extraction, processing, energy generation, logistics, and labor management in one integrated zone. This model matters because the harms of the green transition are not produced only at the point of mineral extraction. They are also produced through the infrastructure that enables battery material production, including coal-fired power plants, smelters, transport corridors, waste systems, and industrial housing arrangements. By focusing on IMIP as a processing hub, this article shows that green extractivism should be analyzed within a broader industrial assemblage rather than solely at extraction sites.

Consequently, the IMIP case does more than confirm Dunlap's framework. It extends this by showing that green extractivism can be driven by state-led downstreaming, justified by both sustainability and nationalist-developmentalist narratives, and materially enabled by the combination of domestic resource policy and foreign industrial capital. For that reason, the Indonesian case adds a broader lesson to green extractivism studies: the transition to a green economy can be used to reorganize extractive capitalism in ways that appear more sovereign, more industrial, and more development-oriented, while still reproducing deep socioecological inequality and carbon-intensive growth in the regions where "green" materials are produced.

Conclusion

This article has argued that the Indonesian government uses sustainability narratives to advance extractive expansion in the Indonesia Morowali Industrial Park. Through Dunlap's green extractivism framework, the analysis shows that IMIP is not simply an industrial response to growing demand for battery minerals. It is also a political and developmental project in which climate crisis and energy transition narratives are mobilized to justify accelerated extraction,

industrial scaling, and downstream upgrading. In this setting, sustainability functions less as a substantive transformation of production than as a legitimizing language for expanding a carbon-intensive and socially unequal industrial model.

The findings show that this process operates through four interrelated dynamics. Crisis is framed as a business opportunity, with nickel positioned as a critical transition mineral and IMIP promoted as a strategic site to capture value from rising global EV demand. Extractive expansion is legitimized through sustainability claims, especially through green development, decarbonization, ESG, and CSR narratives that portray downstreaming as environmentally responsible and socially beneficial. IMIP remains structurally entangled with conventional extractivism because its operations continue to depend on upstream mining expansion, land conversion, heavy infrastructure, and captive coal-fired power. The project rests on a false assumption of renewability because official narratives of mitigation and rehabilitation coexist with unresolved waste governance, cumulative ecological degradation, public health burdens, and livelihood disruption in surrounding communities.

These findings carry broader implications for both theory and policy. Theoretically, the article shows that green extractivism can be organized through an industrial park and downstreaming model, rather than solely through mine sites or frontier extraction zones. It also shows that green extractivism in Indonesia is shaped by a specific combination of state-led industrial policy, resource nationalism, and dependence on transnational capital. It means that green extractivism should be understood not only as a discourse of legitimation, but also as a mode of industrial governance through which states reorganize regulation, infrastructure, and investment to accelerate extractive-industrial growth.

From a policy perspective, the findings suggest that Indonesia cannot rely on sustainability narratives alone if it seeks to present nickel downstreaming as part of a credible green development pathway. Several adjustments are necessary. Environmental governance must be strengthened through stricter enforcement of emission standards, full public access to AMDAL documents, and more meaningful public consultation in industrial and mining decision-making. The dependence of nickel processing on captive coal power must be reduced if downstreaming is to align with the country's own decarbonization

claims. Labor protection and workplace safety need to be improved through stronger oversight of working hours, safety standards, accident prevention, and wage inequality. Waste and tailings governance requires clearer and more precautionary regulation, especially for HPAL-related waste streams and long-term marine and coastal risks. Finally, benefit distribution needs to be addressed more seriously so that local communities are not left carrying the environmental and health costs of an industrial boom whose gains are captured elsewhere.

This study, nonetheless, also has limitations. Because it relies on documentary and archival materials, it is stronger in identifying broad patterns of discourse, governance, and impact than in capturing informal practices, internal decision-making, and everyday lived experiences around IMIP. For that reason, future research should deepen the field-based dimension of green extractivism analysis in Indonesia. Interviews, ethnographic observation, and community-based research would be especially valuable for understanding labor regimes, local perceptions of sustainability, and the uneven social effects of industrial expansion. In addition, future studies could conduct comparative analysis across other industrial parks, especially Indonesia's Weda Bay Industrial Park, to assess how far these green extractivism dynamics travel across different nickel-processing zones. Longitudinal work on health exposure, pollution, and coastal and terrestrial ecological change would also help clarify the cumulative effects that remain only partially visible in documentary sources.

Overall, the IMIP case shows that participation in the global green economy is not automatically transformative. Without deeper structural changes in energy systems, environmental regulation, labor governance, and community protection, green industrialization risks reproducing old extractive logics in a new developmental language. In this sense, IMIP is not only a case of nickel downstreaming. It is also a warning that the global energy transition can reproduce unequal and carbon-intensive forms of development when sustainability is used mainly to justify expansion rather than to reorganize production in practice.

References

Abdullah, Imaduddin, and Andy Sumner. 'Linkage Development as Industrial Policy: The State and Structural Transformation in Resource-Rich Countries'. *Working Paper Series*, 2025.

https://doi.org/10.35188/unu-wider/2025/586-8.

Ahmed, Sirwan Khalid, Ribwar Arsalan Mohammed, Abdulqadir J Nashwan, Radhwan Hussein Ibrahim, Araz Qadir Abdalla, Barzan Mohammed M Ameen, and Renas Mohamed Khidhir. 'Using Thematic Analysis in Qualitative Research'. *Journal of Medicine, Surgery, and Public Health* 6, no. 6 (2025): 100198. https://doi.org/10.1016/j.glmedi.2025.100198.

Akther, Sharmin, Md Reza Sultanuzzaman, Yanrong Zhang, Fahad Almutlaq, and Md Enamul Huq. 'Exploring the Influence of Green Growth and Energy Sources on "Carbon-Dioxide Emissions": Implications for Climate Change Mitigation'. *Frontiers in Environmental Science* 12 (2024). https://doi.org/10.3389/fenvs.2024.1443915.

Andreucci, Diego, Gustavo García López, Isabella M Radhuber, Marta Conde, Daniel Macmillen Voskoboynik, James Farrugia, and Christos Zografos. 'The Coloniality of Green Extractivism: Unearthing Decarbonisation by Dispossession through the Case of Nickel'. *Political Geography* 107, no. 107 (2023): 102997. https://doi.org/10.1016/j.polgeo.2023.102997.

Arl, Nafoura Maharani, and Sang Ayu. 'Foreign Direct Investment dalam Skema Joint Venture: Analisis Dampak Sosial-Ekologis di Kawasan Industri Morowali'. *Jurnal Ilmiah Nusantara* 2, no. 3 (2025): 802–10. https://doi.org/10.61722/jinu.v2i3.4636.

Bainton, Nicholas, Deanna Kemp, Eleonore Lèbre, John R Owen, and Greg Marston. 'The Energy-extractives Nexus and the Just Transition'. *Sustainable Development* 29, no. 4 (2021): 624–34. https://doi.org/10.1002/sd.2163.

Barbieri, Martina, Gianluca Catania, Mark Hayter, Giuseppe Aleo, Milko Zanini, Loredana Sasso, and Annamaria Bagnasco. 'Desk Review as a Methodological Approach for Identifying Policies and Gray Literature: A Case Study'. *Nursing Outlook* 73, no. 6 (2025): 102547. https://doi.org/10.1016/j.outlook.2025.102547.

Boev, Pavel, Barbara Kuepper, and Stefanie Geurts. 'The Destructive Indonesian Nickel Supply Chain'. *Profundo.Nl*. Profundo, 2025. https://profundo.nl/projects/the-destructive-indonesian-nickel-supply-chain/.

Braun, Virginia, and Victoria Clarke. 'Using Thematic Analysis in Psychology'. *Qualitative Research in Psychology* 3, no. 2 (2006): 77–101. https://doi.org/10.1191/1478088706qp063oa.

Bruna, Natacha. 'A Climate-Smart World and the Rise of Green Extractivism'. *The Journal of Peasant Studies* 49, no. 4 (2022): 839–64. https://doi.org/10.1080/03066150.2022.2070482.

Bruna, Natacha. *The Rise of Green Extractivism*. Routledge PP - London, 2023. https://doi.org/10.4324/9781003351870.

Byrne, David. 'A Worked Example of Braun and Clarke's Approach to Reflexive Thematic Analysis'. *Quality & Quantity* 56, no. 1 (2021): 1391–1412. https://doi.org/10.1007/s11135-021-01182-y.

Cabaña, Gabriela, and Katharina Richter. 'Green Extractivism in Colombia: A Scoping Review on Indigenous Rights and Livelihood Impacts, and Policy and Social Movement Responses'. *The Extractive Industries and Society* 25 (2025): 101808. https://doi.org/10.1016/j.exis.2025.101808.

Calderon, J L, N M Smith, M D Bazilian, and E Holley. 'Critical Mineral Demand Estimates for Low-Carbon Technologies: What Do They Tell Us and How Can They Evolve?' *Renewable and Sustainable Energy Reviews* 189 (2024): 113938. https://doi.org/ 10.1016/ j.rser.2023.113938.

Camba, Alvin, Guanie Lim, and Kevin Gallagher. 'Leading Sector and Dual Economy: How Indonesia and Malaysia Mobilised Chinese Capital in Mineral Processing'. *Third World Quarterly* 43 (2022): 1–21. https://doi.org/10.1080/01436597.2022.2093180.

Chagnon, Christopher W, Francesco Durante, Barry K Gills, Sophia E Hagolani-Albov, Saana Hokkanen, Sohvi M. J. Kangasluoma, Heidi Konttinen, et al. 'From Extractivism to Global Extractivism: The Evolution of an Organizing Concept'. *The Journal of Peasant Studies* 49, no. 4 (2022): 760–92. https://doi.org/10.1080/0306615 0.2022.2069015.

Dinata, Septa, Muhamad Ikhsan, Mary Silaban, and A Khoirul Umam. 'The Outcome of China's Investment in Indonesia: Lessons from the Nickel Industry'. Paramadina Public Policy Institute, 2020.

Dorn, Felix Malte, Robert Hafner, and Christina Plank. 'Towards a Climate Change Consensus: How Mining and Agriculture Legitimize Green Extractivism in Argentina'. *The Extractive Industries and Society* 11 (2022): 101130. https://doi.org/10.1016/ j.exis.2022.101130.

Dou, Shiquan, Deyi Xu, Yongguang Zhu, and Rodney Keenan. 'Critical Mineral Sustainable Supply: Challenges and Governance'. *Futures* 146 (2023): 103101. https://doi.org/10.1016/j.futures.

2023.103101.

Dunlap, Alexander, Judith Verweijen, and Carlos Tornel. 'The Political Ecologies of "Green" Extractivism(s): An Introduction '. *Journal of Political Ecology* 31, no. 1 (2024): 436–63. https://doi.org/10.2458/jpe.6131.

Hasan, Md Arif, Ismaila Rimi Abubakar, Syed Masiur Rahman, Yusuf A Aina, Md Monirul Islam Chowdhury, and A N Khondaker. 'The Synergy between Climate Change Policies and National Development Goals: Implications for Sustainability'. *Journal of Cleaner Production* 249 (2019): 119369. https://doi.org/10.1016/j.jclepro.2019.119369.

Heijlen, Wouter, and Chris Duhayon. 'An Empirical Estimate of the Land Footprint of Nickel from Laterite Mining in Indonesia'. *The Extractive Industries and Society* 17 (2024): 101421. https://doi.org/10.1016/j.exis.2024.101421.

Hidup, Kementerian Lingkungan. 'Presiden Joko Widodo Ajak Masyarakat Jaga Kelestarian Lingkungan – Balai Kliring Keamanan Hayati'. *kemenlh.go.id*, 2023. https://balaikliringkehati.kemenlh.go.id/2023/09/18/presiden-joko-widodo-ajak-masyarakat-jaga-kelestarian-lingkungan/.

Kadir, Abdul, Eka Suaib, and La Husen Zuada. 'Mining in Southeast Sulawesi and Central Sulawesi: Shadow Economy and Environmental Damage Regional Autonomy Era in Indonesia'. *Proceedings of the International Conference on Social Studies and Environmental Issues (ICOSSEI 2019)*, 2020. https://doi.org/10.2991/assehr.k.200214.004.

Kurniawan, Adam, Fanny Tri Jambore Christanto, Ferry Widodo, Mukri Friatna, Melva Harahap, Satrio Manggala, Tubagus Soleh Ahmadi, and Uli Arta Siagian. 'Melanjutkan Tersesat, atau Kembali ke Jalan yang Benar'. Wahana Lingkungan Hidup Indonesia, 2025. https://www.walhi.or.id/melanjutkan-tersesat-atau-kembali-ke-jalan-yang-benar.

Kurniawan, Nanang Indra, Poppy Sulistyaning Winanti, and Devy Dhian Cahyati. 'Recarbonization Through Decarbonization: Nickel Extraction and the Deepening of Fossil Fuel Dependence in Indonesia'. *Global Environmental Politics* 25, no. 3 (2025): 1–21. https://doi.org/10.1162/glep.a.12.

Lahadalia, Bahlil, Chandra Wijaya, Teguh Dartanto, and Athor Subroto. 'Nickel Downstreaming in Indonesia: Reinventing

Sustainable Industrial Policy and Developmental State in Building the EV Industry in ASEAN'. *JAS (Journal of ASEAN Studies)* 12, no. 1 (2024): 79–106. https://doi.org/10.21512/jas.v12i1.11128.

Lampe, Ilyas, Anggra Yusuf, Kudratullah Kudratullah, and Gemilang Bayu Ragil Saputra. 'Environmental Communication Strategy against Deep-Sea Tailings Disposal in Morowali'. *Jurnal Manajemen Komunikasi* 8, no. 2 (2024): 242–65. https://doi.org/10.24198/jmk.v8i2.49527.

Li, Danyang, and Wenying Chen. 'TIMES Modeling of the Large-Scale Popularization of Electric Vehicles under the Worldwide Prohibition of Liquid Vehicle Sales'. *Applied Energy* 254 (2019): 113627. https://doi.org/10.1016/j.apenergy.2019.113627.

Masyam, Naufal Alfaruqi, Enni Tri Mahyuni, Andi Ilham Samanlangi, Moh. Khaidir Noor, A Al Faizah Ma'rief, H Hedianto, Tri Utomo Taliding, and Aris Munandar. 'CSR Implementation Program of PT. IMIP on Economic Empowerment and Environmental Sustainability of The Surrounding Community'. *Golden Ratio of Social Science and Education* 5, no. 2 (2025): 444–52. https://doi.org/10.52970/grsse.v5i2.1358.

Naprida, Alifah Risa, Alip Musaqo Fikri, Abdul Malik, Alya Sirena Sari, Mila Praseliya, and M Ridho Ulya. 'Polusi Udara di Kawasan Industri Nikel di Morowali: Dampak, Resiko, dan Solusi Mitigasi'. *Al-Ard: Jurnal Teknik Lingkungan* 11, no. 1 (2025): 26–32. https://doi.org/10.29080/alard.v11i1.2220.

Nasution, Miftahul Jannah, Tugiyono, Samsul Bakri, Agus Setiawan, Murhadi, Christine Wulandari, and Endro Prasetyo Wahono. 'The Impact of Increasing Nickel Production on Forest and Environment in Indonesia: A Review'. *Jurnal Sylva Lestari* 12, no. 3 (2024): 549–79. https://doi.org/10.23960/jsl.v12i3.847.

Oetomo, Dedy Setyo, Asep Hermawan, and Hendi Iskandar. 'Carbon Footprint Optimization in Nickel-Based Industrial Development: A Case Study of IMIP Morowali Through Sustainable Supply Chain Management Approach'. *Journal of Information System, Technology and Engineering* 3, no. 1 (2025): 422–27. https://doi.org/10.61487/jiste.v3i1.131.

Pandjaitan, Luhut Binsar. 'Without Indonesia's Nickel, EVs Have No Future in America'. *Foreign Policy*, 2024. https://foreignpolicy.com/2024/05/01/indonesia-nickel-green-energy-ev-fta-congress/.

Peša, Iva, and Corey Ross. 'Extractive Industries and the Environment:

Production, Pollution, and Protest in Global History'. *The Extractive Industries and Society* 8, no. 4 (2021): 100933. https://doi.org/10.1016/j.exis.2021.100933.

Pradana, Galih Wahyu, Sekar Ayu Kuncaravita, and Aldea Noor Alina. 'Policy and Impact Analysis of Smelter Development in Morowali Sulawesi: A Multidisciplinary Review of Social, Economic and Environmental Aspects'. *East Asian Policy* 16, no. 04 (2024): 114–27. https://doi.org/10.1142/s1793930524000327.

Raffi, Tegar, and Muhammad Fadirah Fauzi. 'Intersection Between Administrative Freies Ermessen and Maladministration in Strategic Nickel Industrial Area Development in Morowali'. *Ius Comparatum: Journal of Law Studies* 1, no. 2 (2025): 39–58. https://doi.org/10.35586/icjls.v1i2.12028.

Rosada, Farah. 'Reforming Environmental Governance in Response to Indonesia's Nickel Industrial Policy: A Critical Assessment of Sustainability Challenges'. *Global Jurnal Politik Internasional* 27, no. 1 (2025). https://doi.org/10.7454/global.v27i1.1377.

Rushdi, Muhammad, Apditya Sutomo, Pius Ginting, Risdianto, and Masri Anwar. 'Rangkaian Pasok Nikel Baterai dari Indonesia dan Persoalan Sosial Ekologi'. Aksi Ekologi & Emansipasi Rakyat, 2020. https://www.aeer.or.id/wp-content/uploads/2024/11/Nikel-baterai-2021_compressed.pdf.

Sangadji, Arianto. 'HPAL: A New Challenge for the Environment in Indonesia'. The Action for Ecology and People Emancipation (AEER), 2024. https://www.aeer.or.id/en/hpal-a-new-challenge-for-the-environment-in-indonesia/.

Sangadji, Arianto, and Pius Ginting. 'Multinational Corporations and Nickel Downstreaming in Indonesia'. *Aeer.or.Id*, 2022. https://www.aeer.or.id/en/multinational-corporations-and-nickel-downstreaming-in-indonesia/.

Santoso, Rizal Budi, Windy Dermawan, and Dwi Fauziansyah Moenardy. 'Indonesia's Rational Choice in the Nickel Ore Export Ban Policy'. *Cogent Social Sciences* 10, no. 1 (2024). https://doi.org/10.1080/23311886.2024.2400222.

Statista. 'Indonesia Nickel Mine Production 2021'. *Statista*, 2025. https://www.statista.com/statistics/260757/indonesian-mine-production-of-nickel-since-2006/.

Sunuhadi, Dwi Nugroho, None Ernowo, Prima Muharam Hilman, and Triswan Suseno. 'Availability of Indonesian Nickel Reserves and

Efforts to Improve Reserves Resistance and Its Impact to Economic Growth'. *Mineral Economics* 37, no. 3 (2024): 601–17. https://doi.org/10.1007/s13563-024-00443-0.

Taufik, Yani, Sarlan Adijaya, and Iskandar Zainuddin Rela. 'Nickel Smelter on Social-Economics and Environmental Issues', 2022. https://doi.org/10.21203/rs.3.rs-2232605/v1.

Thurbon, Elizabeth, Sung-Young Kim, John A Mathews, and Hao Tan. *Developmental Environmentalism: State Ambition and Creative Destruction in East Asia's Green Energy Transition*. Oxford University Press, 2023.

Tritto, Angela. 'How Indonesia Used Chinese Industrial Investments to Turn Nickel into the New Gold'. *Policycommons.Net*, 2023. https://policycommons.net/artifacts/3535290/how-indonesia-used-chinese-industrial-investments-to-turn-nickel-into-the-new-gold/4336593/.

Tritto, Angela, and A Camba. 'State-Facilitated Industrial Parks in the Belt and Road Initiative: Towards a Framework for Understanding the Localization of the Chinese Development Model'. *World Development Perspectives* 28 (2022): 100465. https://doi.org/10.1016/j.wdp.2022.100465.

Umah, Anisatul. 'Bukan Vale atau Antam, Ini Dia Raja Nikel RI'. *CNBC Indonesia*. cnbcindonesia.com, 2021. https://www.cnbcindonesia.com/news/20210917142525-4-277151/bukan-vale-atau-antam-ini-dia-raja-nikel-ri.

Voskoboynik, Daniel Macmillen, and Diego Andreucci. 'Greening Extractivism: Environmental Discourses and Resource Governance in the "Lithium Triangle"'. *Environment and Planning E: Nature and Space* 5, no. 2 (2021): 787–809. https://doi.org/10.1177/25148486211006345.

Wijaya, Trissia, and Lian Sinclair. 'An EV-Fix for Indonesia: The Green Development-Resource Nationalist Nexus'. *Environmental Politics* 34, no. 2 (2024): 1–23. https://doi.org/10.1080/09644016.2024.2332129.

Yin, Robert K. *Case Study Research and Applications: Design and Methods*. 6th ed. Sage Publications PP - Thousand Oaks, California, 2018.

Zheng, Xiaoqi, Yonglong Lu, Cuimei Ma, Jingjing Yuan, Nils Chr Stenseth, Dag O Hessen, Hanqin Tian, Deliang Chen, Yi Chen, and Sheng Zhang. 'Greenhouse Gas Emissions from Extractive

Industries in a Globalized Era'. *Journal of Environmental Management* 343 (2023): 118172. https://doi.org/10.1016/j.jenvman.2023.118172.