

Community participation as a human right: Perspective of Indonesia's nickel downstream on the natural resource curse phenomenon

Daryanti^{1*}, Albertus Sentot Sudarwanto¹, Bayu Sujadmiko², Febryani Sabatira³

- ¹Faculty of Law, Universitas Sebelas Maret, Surakarta, Indonesia
- ²Faculty of Law, Universitas Lampung, Bandarlampung, Indonesia
- ³Master of Maritime Policy, University of Wollongong, Australia

*Corresponding Author: daryanti02@student.uns.ac.id

Abstract

Introduction to the Problem: Various controversies over Indonesia's nickel downstreaming policy as a government move to add economic value to mining products are important issues that need to be studied. This problem is mainly because Indonesia is a developing country that has abundant natural resources, but has not been able to improve welfare and development for communities in mining areas, especially in the aspect of community participation. This research then highlights the perspective of the Natural Resource Curse (NRC) phenomenon for Third World Approaches to International Law (TWAIL) countries in the paradox of development stemming from the exploitation of natural resources.

Purpose/Study Objectives: Community involvement in mining and other industrial activities is needed. This is related to decision making. For example, in Environmental Impact Assessment/ Analisis Mengenai Dampak Lingkungan (AMDAL) and other activities related to the lives and livelihoods of communities around mining activities. The basis of public participation is part of human rights as stated in the Constitution and International Conventions that have been ratified by Indonesia.

Design/Methodology/Approach: This research uses legal normative research by examining legislation regarding nickel downstreaming as stated in Law No. 30 of 2020 on the Second Amendment to Law No. 4 of 2009 On Mineral and Coal Mining and Law No 6 of 2023 on Cipta Kerja,

Findings: The findings in this study show the lack of community involvement in mining and other industrial activities in Indonesia. The existence of community participation as a human right is necessary to achieve a balance of economic growth and environmental protection as an anti-thesis to the curse of natural resources. In addition, governance and enforcement and supervision by the government in the mining sector need to be carried out effectively.

Paper Type: Research Article

Keywords: Community Participation; Nickel Downstream; Human Rights; Natural

Resource Curse





Copyright ©2024 by Author(s); This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License. All writings published in this journal are the personal views of the

authors and do not represent the views of this journal and the author's affiliated institutions.

Introduction

Indonesia's nickel downstream policy began to be implemented in 2020 with the commencement of smelter construction activities to upgrade nickel ore grades. Mining activities that begin will have risks and require mitigation in their implementation. Prior to conducting mining activities, community participation is required as involvement in decision-making that will impact welfare, safety and the environment in order to reduce risks and vulnerabilities for local communities (Saes & Muradian, 2021).

The guarantee of the right to public participation was first set out in Principle 10 of the 1992 Rio Declaration on Environment and Development. Community participation is considered to be the core of solving environmental problems and becomes a legislative instrument. From the development of Principle 10 of the 1992 Rio Declaration, it is also contained in Article 7 of the Arhus Convention and Sustainable Development Goals (SDGs) goal 17 (Ruppel & Houston, 2023).

Discussing community participation in environmental issues in Indonesia, which is still small and vulnerable to implementation, such as environmental problems from the results of nickel mining management activities. The development of the mining industry shows production progress on its utilisation in meeting human needs such as stainless steel, automotive industry, metal plating and batteries (Radhica et al., 2023). Mining sectors such as nickel contribute to Indonesia's income as a leading nickel producer with revenues of \$20.9 billion in 2021 (Santoso et al., 2023). Meanwhile, in 2022, the export value is claimed to increase by 745% or at least USD33.81 billion from the 2017 export value (Indonesia.Go.Id, 2023). Natural resources in the form of nickel ore as a form of non-renewable natural material have limited reserves that will run out within a certain period of time. Estimates of future nickel scarcity and supply are expected to occur after 2100 (Watari et al., 2021). Anna Hulda O. in her research mentioned, in an economic simulation of the amount extracted from nickel with the best nickel ore grade will be imposed after price increases and cost reductions. This model will affect the supply, ore grade and market price (Olafsdottir & Sverdrup, 2021).

Before Law No. 3 of 2020 was used as the basis for the current mining downstream, the discourse on nickel downstream was already stipulated in Article 103 of Law No. 4 of 2009 On Mineral and Coal Mining that mining products must then be processed and refined domestically before being exported abroad. Nickel ore without prior refining is prohibited from being exported abroad in its raw state (Krustiyati & Gea,



2023). Then in government regulation No. 1 of 2017 On the Operator of Mining Business Activities, it has just begun to re-discuss the construction of smelters in mining companies that have Mining Business Licenses/ Izin Usaha Pertambangan (IUP) and Special Mining Business Licenses/Izin Usaha Pertambangan Khusus (IUPK) (Krustiyati & Gea, 2023).

The nickel downstreaming, which is the current mainstay and respected by the government is a form of the government's goal of adding economic value as a surefire step in economic development for welfare. Another reason is to attract investment to improve the electric vehicle supply chain (Lahadalia et al., 2024). This paradox developed during Climate Rights International's (CRI) investigative report on the reality of mining centres that have the potential to damage the environment and impoverish communities in the midst of natural resource linkages (Climate Rights International, 2024). One small example is a report from Climate Rights International on water pollution as a source of life for local communities due to unsafe waste disposal. Indigenous peoples' organizations filed a complaint with the Environmental Agency (EA) against five companies PT Halmahera Sukses Mineral, PT Karunia Sagea Mineral, PT First Pacific Mining, PT Tekindo Energi, and PT Weda Bay Nickel to temporarily stop their mining activities in Central Halmahera (Climate Rights International, 2023). EA and the local government only have the power to provide recommendations and not order operations because the basic reason is Law No. 6 of 2023 on the approval of the Government Regulation on Job Creation which regulates that the national authority has full authority to stop it (Climate Rights International, 2023). Based on the letter numbered: 600.4.5.3/1120/LH.3/IX/2023, the results of the investigation proved that the mining company located in Central Halmahera Regency and other companies have polluted the environment, namely the Sagea River. The recommendation excludes PT Weda Bay Nickel regarding the mining activities (Forest Watch Indonesia, 2023).

North Maluku Province, especially in the Central Halmahera district, has many mineral mining license activities (Nancy, 2022). Gebe Island is an island that is indicated to contain many minerals such as laterile nickel ores (Nancy, 2022). Since the 1980s the island has been exploited by giant and state-owned companies. The most complex question is how Indonesian government policies from between leadership periods have provided welfare for the community, especially local communities in the North Maluku Province. This condition leads the author to the existence of a phenomenon called the natural resource curse theory. In research by Hania Rahma, regarding the relationship between the many empirical facts that discuss the existence of the Natural Resource Curse (NRC) phenomenon in the development paradox derived from the exploitation of natural resources (Rahma et al., 2021).

One of the voices of the NRC theory is Richard Auty who states that there are consequences of the adverse impact of natural resources on economic growth efforts



(Auty, 2002). Economists conclude that the presence of abundant natural resources will be influenced by sensitive policies and the quality of state institutions (Ali et al., 2024). Natural resource wealth in the form of nickel ore and other mining products in Indonesia is spread across several Indonesian regions such as Kalimantan, Sumatra, Sulawesi and Papua. The wealth of natural resources located in these areas is not impossible to face the NRC phenomenon. Although what is worse at the national level is that it does not experience the NRC phenomenon (Rahma et al., 2021).

The existing body of research on mining governance, particularly concerning Corporate Social Responsibility (CSR) and Environmental Impact Assessments (EIA/AMDAL), has largely focused on corporate compliance and regulatory frameworks while overlooking the crucial role of meaningful community participation. Despite international principles such as Principle 10 of the 1992 Rio Declaration and Article 7 of the Aarhus Convention advocating for public involvement in environmental decision-making, practical implementation remains inconsistent, especially in resource-rich regions like Indonesia. While studies like those by *Thorén Hedin & Ranängen* (2017) explore trust-building between mining industries and local communities, there is a notable gap in understanding how participatory governance can be effectively integrated into the early stages of mining projects, particularly in Indonesia's nickel downstreaming initiatives.

This research addresses this gap by examining how community involvement—beyond mere consultation—can influence environmental and socio-economic outcomes in nickel mining. Current practices often limit public participation to formalities, even after environmental permits are granted, leading to persistent ecological degradation despite AMDAL approvals. The study builds on insights from *Rangkuti et al.*, (2023) who highlight the importance of EIA in decision-making, but extends the discussion by emphasizing the need for inclusive feasibility assessments that incorporate local knowledge and human rights considerations, as suggested by *Nasr-Azadani et al.*, (2022).

By shifting the focus from top-down CSR approaches to participatory environmental justice, this research contributes a new perspective on how government policies, corporate accountability, and community engagement can work synergistically to mitigate environmental risks while promoting equitable economic development. It challenges the conventional separation between regulatory compliance and grassroots involvement, proposing instead a more integrated model where local communities play an active role in shaping mining governance—ensuring that Indonesia's nickel downstreaming not only boosts economic value but also upholds ecological sustainability and social equity.

Methodology

This research uses normative legal research by examining laws and regulations (Efendi dan Ibrahim, 2016) regarding nickel downstreaming as stated in Law No. 30



of 2020 on the Second Amendment to Law No. 4 of 2009 On Mineral and Coal Mining and Law No. 6 of 2023 On Cipta Kerja. Based on derivative regulations, community involvement and the active role of mining business actors are also stated in Article 19 of Government Regulation No 98 of 2021 On the Implementation of Mineral and Coal Mining Business Activities, one of which is in the form of community development and empowerment (Pengembangan dan Pemberdayaan Masyarakat/PPM). PP No 98 of 2021 also mentions community participation in feasibility studies related to the need for an Environmental Impact Assessment (Analisis Mengenai Dampak Lingkungan/AMDAL).

The elaboration of community participation as a basic human right has not been widely discussed in several studies. Based on the results of this study, community participation can be encouraged and utilised effectively in sectors related to natural resource utilisation. In answering the challenges, it is referred to using the theory of development law on policy formation and the theory of the curse of natural resources on the problems of natural resource management in Indonesia as a developing country. This analysis also uses references to international and national journals and relevant data such as statistical data as qualitative material to describe and support legal arguments in this research.

Results and Discussion

The Economic Development Paradox of the Natural Resource Curse: The Effect of Nickel Downstream Policy in Indonesia

Indonesia as a rule of law characterises aspects of national life based on legislation, this is as stated in Article 1 Paragraph (3) Constitution of Republic Indonesian/Undang-undang Dasar Negara Republik Indonesia (UUDNRI) 1945. In the theoretical study by Professor Mochtar Kusumaatmadja, it discusses the theory of Development Law (Aulia, 2019) as in Article 1 Paragraph (3) UUDNRI 1945, that law can be a means of reform in society (Hukum Online, 2022). Furthermore, M. Zulfa Aulia explained about the theory of Development Law Professor Mochtar Kusumaatmadja also relates that the function of law that lives in society in the process of building is known as National Development. Communities that are in the process of building should not only maintain order, but must direct social change and development to take place regularly and inclusively (Aulia, 2019).

Government policies, especially those related to the economy and those related to the environment, require sustainable policies (OECD, 2022). Sustainable policy is one of the country's promises in global commitments, one of which is in the 17 goals of the Sustainable Development Goals. Countries around the world in the frame of policy documents and state agendas direct goals in order to link the rule of law (SDG Goal 16) with economic development (SDG Goal 8). This is done by countries such as the European Union, which is ambitious to emphasize the link between the rule of law and economic development in the 2030 Agenda and government policies



(Rabinovych, 2019). Regarding the idea of forming inclusive development policies and directions and "sustainable development" as the goal of the SDGs (Gupta & Vegelin, 2016), one of the main points is to prioritize balancing economic development goals with ecological, social aspects and political views. In *Gupta and Vegelin's* research paper, the indicator of inclusiveness is assessed in terms of three main dimensions: social, ecological, and rational as the target applied to Goal 17 of the SDGs (Gupta & Vegelin, 2016). Goal 17 of the SDGs reinforces partnerships with civil society and government to ensure sustainable mining that extends beyond the life of the mine itself. This can support mining that incorporates sustainable technologies and promotes the welfare of local communities (UNDP, 2023).

The mining industry in reality prioritises maximum economic benefits over balancing the environment. This has led to environmental problems in developing countries due to unsustainable exploitation of natural resources. For example, Adam Lampert states that overexploitation of natural resources will reduce the rate of future economic growth due to limited natural resources (Lampert, 2019). Referring to this issue, the authors provide an idea of the legal implications that government control will provide oversight and direction for policy implementation and foster concern and empathy as public participation in natural resource exploitation activities. Determining the right framework for the three elements of communities, public authorities and companies or producers to be able to balance good environmental governance of sustainable mining processes and outcomes (Omotehinse & De Tomi, 2023).

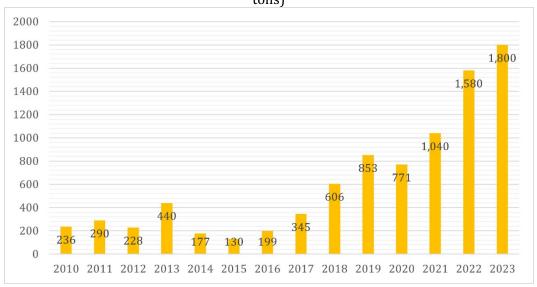
The balance between economic development goals and social and environmental welfare is increasingly becoming a difficult component to unite. Efforts to keep away from the phenomenon of thinking that there is a curse on natural resources include maximising supervision and law enforcement of mining management. On the other hand, most of these problems cannot be handled because they arise from political interests and policy agendas and supervision from the government that is not optimal (Narh, 2023). This research highlights the current government's vaunted policy on nickel downstreaming. The most prominent aspect is the problem of social inclusiveness and environmental inclusiveness as a result of the objectives of the nickel downstream programme.

The Indonesian government's policy in encouraging investment growth in Indonesia is carried out by changing various laws and regulations and their derivatives to facilitate and attract investors, one of which is Law No. 6 of 2023 on the Ratification of Cipta Kerja. Based on a statement from the Ministry of Investment that in 2023 investment has reached a value of IDR 1,418.9 trillion or at least a 17.5% increase from 2022 (year-on-year) (Cahyaningrum, 2024). This achievement is also claimed to have absorbed 1,823,543 workers (databoks.id, 2024).

Abundant natural resources, especially in the nickel ore sector, make Indonesia the country with the largest nickel reserves in the world after Australia. Indonesia as a

country with great natural resource wealth is blessed with its earth content with nickel reserves estimated at 21 million tons and it is estimated that these reserves will reach 55 million metric tons by 2023 based on data and reports from the United States Geological Survey (USGS).

Figure 1. Nickel mine production in Indonesia from 2010 to 2023 (in 1,000 metric tons)



Source: Statista (2024)

Based on data from Statista, nickel production in 2010 to 2023 in Indonesia has increased. Significantly, the increase occurred from 2018 to 2023. In 2023, nickel production in Indonesia is estimated to reach a yield of 1.8 million metric tonnes (Statista, 2024). Indonesia is the world's largest producer of nickel, most of which is exported to countries such as China, Australia, Singapore, the Netherlands (Observatory of Economic Complexity, 2024). Based on data from the Central Statistics Agency (Badan Pusat Statistik/BPS) throughout 2023 Indonesia has exported 1.26 million tonnes of nickel or at least 89% of the total nickel mining products to China.

As a continuation of the amendment of Law No. 4 of 2009 to increase the economic value of mining products, Law No. 3 of 2020 also relaunches and accelerates the implementation of nickel downstreaming. Furthermore, the Minister of Energy and Mineral Resources Regulation No. 6 of 2024 on the Completion of the Construction of Mineral Refining Facilities in the Country aims to regulate the completion of the construction of metal mineral refining facilities by holders of Mining Business Licences or Special Mining Business Licences that have entered the commissioning stage. This stage is referred to as the stage of activities carried out after the construction of the refining facility and assessing the completeness, suitability, feasibility of equipment and other readiness. Since the launch of the nickel downstream policy, the Indonesian government has continued to encourage the



construction of domestic smelters to manage mineral production, especially nickel production.

Nickel
Bauxite
Iron Minerals
Copper
Manganese Mineral
Zinc
0 5 10 15 20 25 30 35

Figure 2. Development Plan and Additional Number of Smelters in 2021

Source: Ministry of Energy and Mineral Resources (2023)

Based on data from the Ministry of Energy and Mineral Resources, the government has a target of building smelters with a total of 53 smelters by 2021 with a target completion in 2024 (Kementerian Energi dan Sumber Daya Mineral, 2023a). In 2019 there were 17 smelters, 11 of which were nickel smelters (Direktorat Jenderal Mineral dan Batubara, 2021). This coverage also includes other mining sectors and products such as copper, iron, lead or zinc commodities that are in the process of building smelters. This reason then becomes the basis for the government to give leeway to export. Based on Ministerial Regulation of MEMR No. 6 of 2024 as a condition that mining industry companies are required to manage or increase the quality levels of metals and minerals through refining, namely by building smelters that are physically ready and meet existing facilities by Mining Business Permit Holders (Izin Usaha Pertambangan / IUP) or Special Mining Permit Holders (Izin Usaha Pertambangan Khusus/ IUPK). Similar to the previous regulation, in Article 2 and Article 3 of the Minister of Energy and Mineral Resources Regulation, IUP or IUPK holders who are committed to building smelters or cooperating with other refining facilities can carry out the process of selling mineral mining products other than nickel out of the country or export in certain quantities using the provisions of the Traif Post/Harmonised System. The difference is in the readiness of the physical refining facilities that must be ready or what is called 'the Commissioning stage'. Just like in the previous MEMR Ministerial Regulation, this policy is a form of inconsistency in the downstream mining policy, when the government imposes restrictions on nickel products but provides leeway for other mineral mining



products by referring to Article 2 Paragraph (2) Ministerial Regulation MEMR No. 6 of 2024.

Furthermore, to encourage the ecosystem in the downstream nickel industry, the government must strive to improve the quality of domestic nickel production to achieve the goal of increasing added value for the industry this mining (Naryono, 2023). Based on Press Release Number: 500.Pers/04/SII/2023 from the Ministry of Energy and Mineral Resources regarding the current number of smelters, 25 smelters are under construction and require a supply of at least 75 tonnes per year. These smelters are expected to increase in 2024 and beyond (Kementerian Energi dan Sumber Daya Mineral, 2023b). According to a press release from the Ministry of Energy and Mineral Resources, 25 smelters are currently under construction and require supplies of at least 75 tons per year. These smelters are expected to increase in 2024 and beyond. Examining the role of nickel mining for the purpose of increasing economic value in order to achieve development in this study, the authors did not find the most appropriate reason in showing that the welfare of the community in the mining area has increased in line with the current downstream mineral mining program. In addition, the efforts of sustainable mining activities are not the main component that must be fulfilled with the evidence of several mining cases that damage the environment (Climate Rights International, 2024). Whereas based on Ministerial Regulation of MEMR No. 26/2018 On the Implementation of Good Mining Practices and Supervision of Mineral and Coal Mining, one of the environmental documents mentioned in Article 1 Paragraph (14) Ministerial Regulation of MEMR No. 26/2018 environmental management or through AMDAL is a norm that must be fulfilled. However, there is no further definition of sustainable mining.

The realisation of efforts to encourage green economic growth as a program and scenario from Bappenas in 2019, shows a low-carbon economic growth path for 2020 to 2024 will affect Gross Domestic Product (GDP) (Bappenas, 2023). This is outlined in the National Medium-Term Development Plan/ Rencana Pembangunan Jangka Menengah Nasional (RPJMN) Program in a five-year period. Based on data from the Central Statistics Agency/ Badan Pusat Statistik (BPS), by 2023, the Gross Domestic Product (GDP) at current market prices will reach IDR 20,892.4 trillion. Meanwhile, GDP per capita only reached IDR 75.0 million, equivalent to US\$ 4,919.7. In 2023, Indonesia's GDP decreased from the year of its size with an achievement of 5.05% (Badan Pusat Statistik, 2024).



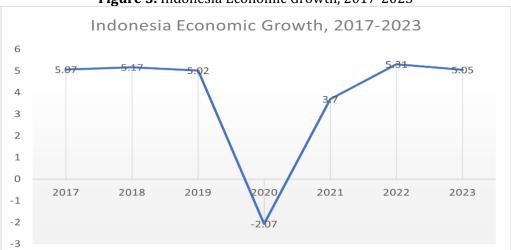


Figure 3. Indonesia Economic Growth, 2017-2023

Source: Central Bureau of Statistics/Badan Pusat Statistik (2024)

In the Indonesian government information portal, delivered by the Coordinating Minister for Maritime Affairs and Investment, Luhut Binsar Pandjaitan said that the export value of nickel downstream products in 2022 reached USD 33.81 with a rupiah value of IDR 503.2 trillion (Indonesia.Go.Id, 2023).

The nickel downstreaming policy in addition to adding value to this commodity, refers to the benefits of the mining sector is to improve the economy of the mining area by providing employment to local communities (Syarifuddin, 2022), and improve the skills of local communities. Learning from Brazil for the mining sector is a sector that has a large economic impact (Santos et al., 2024). However, there are various problems that should be watched out for and handled by the government, for example with cases of environmental crimes (Santos et al., 2024). Licensing made by the Brazilian government, namely with environmental licensing, is made flexible with the claim that bureaucratic efforts in efficiency and productivity. This form of flexibility occurred after the existence of environmental crimes, which then this incident was influenced by the public officials of the governor of Minas Gerais submitting Bill 2.946/2015 which regulates the provisions that environmental licensing must be made flexible in the state (Pastran & Mallett, 2020). This was influenced by political decisions by approving the bill in 2016, in which the majority of parliamentarians occupied positions related to mining or the environment (Guimarães, 2019). In 2019 there were impacts resulting from environmental crimes such as dams at Vale's mine breaking down in Minas Gerais (Pastran & Mallett, 2020).

Furthermore, with regard to mining products that are expected to encourage economic improvement, especially in Indonesia, it will be related to the value of exports in international trade. This research then takes the perspective of *Patunru's* (2023) research on the linkages between 'downstream' policies and local mining products and requirements. One of the cases is nickel downstreaming, and



Indonesia's position in the World Trade Organisation (WTO) and the development of trade agreement relations, as well as the approach to commodity balance in trade (Patunru, 2023). These three things have a related influence, as the downstreaming policy implemented with Law No. 3 of 2020 on Mineral and Coal Mining presented a lawsuit in the World Trade Organization (WTO) by the European Union. The reason given by Indonesia in this case is that this restriction is temporary because it prevents the limitation of domestic products, and as a Good Mining Practice (GMP) effort. However, in the judgement, Indonesia could not prove the reasons given (World Trade Organization, 2023). The nickel downstream policy in Indonesia and the lawsuit at the WTO also affect the global nickel price because it is related to resources and demand (Zheng et al., 2022). On the other hand, it also affects the views of the international community as consumers of any product that has an impact on environmental damage and is not an environmentally sustainable product (Maduku, 2024).

The government's policy of increasing the selling value of nickel and other mineral mining products by self-managing is a form of goal in the action of increasing economic independence. However, risk mitigation of challenges and problems that occur such as environmental damage needs to be anticipated, one of which involves community participation in decision making. Based on Law No. 3 of 2020 and Ministerial Regulation of MEMR No. 26 of 2018, environmental management activities require community involvement and participation. This involvement is a planned effort because the community will be affected either negatively or positively in the decision-making process or policy. Norms towards environmental protection should not be set aside just for the sake of gaining economic value and worse for the interests of some groups.

The urgency of environmental protection in the mining sector needs to be monitored by the government. Environmental protection is upheld as an important fundamental pillar to achieve sustainable development (Wu & Tham, 2023). Environmental protection will affect various aspects of people's lives in mining areas such as human rights and rights guaranteed by the constitution including the right to life, sanitation, health, water, and food (OHCHR, 2024).

Environmental Issues and Community Engagement: The Curse of Natural Resources and Third World Approaches to International Law (TWAIL)

1. Community Involvement as a Human Right: A Perspective on the Government's Nickel Downstream for the Purpose of Economic Improvement and Development The goal of increasing economic value through nickel downstream programmes and policies faces problems and challenges. The increase in the export value of nickel ore by more than 300% since 2017 affects GDP, investment and value. The problem then arises as a result of the management and exploitation process causing negative impacts on society and the environment.



The conception of nickel downstreaming is a proud program of the Joko Widodo administration. Reporting from the Coordinating Ministry for Maritime Affairs and Investment, Nickel Downstream is the first step in the transformation and acceleration of the Indonesian economy. Spatially, nickel downstreaming will encourage quality investment and industrialization programs in Eastern Indonesia. In addition, nickel downstreaming is vaunted as a boost to Indonesia's economic performance and one of the best among G20 member countries (Kementerian Koordinator Bidang Kemaritiman dan Investasi, 2023). On the other hand, the implementation and governance of nickel mining exploitation in Indonesia is still an important note to be improved because it adversely affects the environment and violates the rights of local communities (Karsadi & Aso, 2023).

Governance in its implementation requires effectiveness and verifiability as well as a strong commitment from government actors to the framework for managing mineral resources and the minerals and metals industry (Christmann, 2021). This governance can become grey when interests are inserted that are not in the public interest but for the benefit of some groups. As the Third World Approaches to International Law (TWAIL) theory prioritises the interests of society in general over the state, avoiding concepts of international law that seek to exploit developing countries.

Referring to the fundamental reason for nickel downstreaming to increase national economic value and encourage the welfare of communities around mining areas. In fact, based on the amount of Indonesia's nickel reserves, 90% of nickel reserves are spread across Central Sulawesi, South Sulawesi, Southeast Sulawesi, North Maluku and Papua. The Central Bureau of Statistics (Badan Pusat Statistik/BPS) noted that in 2023 the poverty rate (Badan Pusat Statistik Indonesia, 2023) in the Maluku region increased from the previous year, namely from 22.94 to 23.40 in urban areas or an overall increase of 1.67 in the Maluku region and 4.95 in the North Maluku region (Badan Pusat Statistik Indonesia, 2023). Meanwhile, nationally, based on data from the Central Bureau of Statistics (BPS), Indonesia's economic growth as the world's largest nickel producer has increased because it plays an important role in the global market. The value of Indonesia's exports to export destination countries increased in 2020 to 2023. Based on BPS data shows that in vulnerable January-November 2022 the value of exports to nickel export destination countries including China at US \$ 3.88 billion; Japan US \$ 1.1 billion; South Korea US \$ 106.94 million.

2. Environmental and Community Involvement Issues of Nickel Downstreaming: A Third World Approaches to International Law (TWAIL) Perspective

The nickel downstream policy indicates the start of a massive practice of natural resource exploitation in the nickel mining sector. The response of local communities to nickel mining and mining activities responded with various concerns such as refusing because they were worried about the environmental impacts caused. Bambang Hudayana in his research mentioned that the communal community in Central Sulawesi committed violence as a form of negotiation between the community



and mining companies. This was triggered by environmental damage, and land grabbing from local communities who were targeted for mining (Hudayana et al., 2020). In the case of communal violence, there were at least six acts of communal violence committed by the community over a period of ten years during the operation of the nickel industry in the Bahodopi District area. This is based on mapping from six sources in Bambang Hudayana's research (Hudayana et al., 2020). Although in the existing legal rules that the nickel industry received permission for industrial activities to exploit natural resources there, problems arise due to the absence of strict supervision from the government against the threat of environmental damage and the rights of local communities to their customary rights or land (Hudayana et al., 2020).

Public participation is based on Principle 10 of the 1992 Rio Declaration, which states that every individual has the right to information and opportunities for decision-making. This is a milestone for Principle 10 of the 1992 Rio Declaration in international law in terms of encouraging states to facilitate public awareness and participation. Article 7 of the Aarhus Convention also requires states to allow their citizens to be involved in environmental decision-making. Upholding public participation in environmental matters is also part of human rights as it relates to the right to a good environment (Daryanti, 2025).

Referring to Pour and McGregor's research, discussing social inclusiveness will be rooted in the concepts of human rights, regional development, rights and capabilities, inequality, and redistribution. These issues are often faced by less developed countries and developing countries (*Third World Approaches to International Law*/TWAIL) (Natarajan, 2012). There are seven reasons for strengthening the social inclusiveness rationale (Pouw & McGregor, 2014): 1) this reason shows the role of law to encourage the protection of human rights and dignity; 2) and the purpose of the economy is to improve social welfare; 3) uphold public involvement in consumption and labour markets; 4) the reason for public health in conditions of increased investment in areas of economic activity; 5) the reason for upholding democracy over the sharing of results and levels of prosperity for all parties; 6) the reason for social security which refers to meeting the needs of society; and 7) the reason for humanitarian concerns for the most vulnerable groups.

The TWAIL movement began in the 1960s asserting sovereignty, and non-intervention over natural resources which later developed into international environmental law (Rao, 2022). The problems of developing countries in TWAIL's perspective are poverty, over-exploitation of natural resources, lack of rights involving community participation (Luipert, 2019), and limited information and knowledge. This concept emerged after World War II as a response to the underdevelopment of countries in the southern hemisphere such as Asia and Africa. One of the TWAIL agendas that discusses this issue is how the fate of the poor and the environment in developing countries. Based on *Indira Gandhi's* speech in the TWAIL



idea that towards the problem of balance between development and the environment amid the gap between developed and developing countries in the south (Rao, 2022): "...it is to link the plight of the poor and the environment that binds countries to communal endeavour. But there is a vulnerability to arrogance and disruptive political interests."

Relevant to this research, communities around mining are predominantly poor and have rights to benefits from natural resources. The existence of mining companies and claims of increased investment from nickel downstreaming should be able to sustain and prosper the mining communities. This will depend on the efforts of the state as the guarantor of community rights in the enforcement and supervision of the objectives of the nickel downstreaming policy.

Later, this backwardness emerged when the TWAIL state confronted human rights. The correlation between TWAIL and human rights has not been widely discussed. The aim of TWAIL is to question any decision in international law that does not favour the countries of the global south. The concept of human rights basically originated from European countries. Makau Matua argues that the impartiality of human rights as a form of state operation controls the barbarity of the loss of human rights. One way to avoid inhumane acts is through the state adhering to human rights norms (Ramina, 2018). This applies to the state's efforts to safeguard community rights related to natural resource exploitation efforts.

Furthermore, this research takes reference to the issue between the relationship between environmental damage and local community involvement in mining activities. Before a mining business starts its activities, business actors are required to take care of EIA (Environmental Impact Analysis) with the aim of ensuring that every business activity carried out or the development process operates sustainably without causing environmental damage and sacrificing the environment that will have an impact on society (Yakin, 2017).

Whereas every company is required to have an AMDAL (Environmental Impact Analysis) which is a recording document regarding the large and important impacts of a business on the environment and for the decision-making process in it against risks that may occur. This is as stipulated in Article 22 of Law No. 32 of 2009 that every business activity is required to have an EIA/AMDAL including the mining industry. Supposedly with the existence of an EIA or environmental permit, the impact of mining activities will be smaller, but this is the opposite. Although AMDAL analysis is one of the requirements for the establishment of a business that touches the environment, AMDAL is also useful for the government, business initiators, and the community. Some of the benefits for the community are: 1) knowing from the beginning about the impacts that will be caused by the business activity; 2) having a stake in implementing controls; 3) being involved in every decision-making process (Yakin, 2017).



Marco Tulio argues that when local communities are not engaged in mining-related decision-making, they face increased vulnerability and significant risks (Zanini et al., 2023). These vulnerabilities and risks include inequities in decision-making; uncontrolled environmental degradation; threats to community safety and well-being; vulnerability to disasters; dependence on all company decisions by local communities (Zanini et al., 2023).

Research on community participation as a key to building trust in mining companies has received little attention for its implementation (Milanez et al., 2021). Aspects of risk governance formed from the role of community participation aim to shape institutional responses to prevent and mitigate disasters (Fra. Paleo, 2015). M.T. Zanini explained in his research that mining activities often pose a high risk of environmental damage and will directly have a negative impact on the community. Zanini explained in his research that mining activities often pose a high risk of environmental damage and will directly have a negative impact on society. In addition, with the era of technological development that requires a lot of mineral materials and increases minerals globally, it encourages mineral producing countries such as Indonesia to rush to meet global needs with a shadow of investment and favourable economic value. Tragically, disasters in the form of failure to manage mineral waste products in tailings dams pollute the environment due to improper management (Zanini et al., 2023). One example of pollution due to tailings waste is in the Halmahera islands which results in water pollution and loss of biodiversity (Climate Rights International, 2024).

In Indonesia, environmental problems are encountered when nickel mining companies dispose of processed products or tailings to the sea and to areas close to residential areas. If marine mining has environmental impacts such as 1) threats to marine ecosystems and the survival of thousands of species; 2) impacts to the whole ocean in general; 3) carbon release; 4) changes in ocean composition due to extraction of toxic metals; 5) other marine ecosystem impacts. From mining issues, it is necessary to consider the environmental impacts that may occur (Rahma et al., 2021). Then the environmental problems of nickel mining or other mining will certainly have the same impact such as 1) damaging the ecosystem of the area that is the object of mining such as forests; 2) carbon release; 3) damaging food sources local communities due to contamination from the extraction of toxic metals, and other environmental damage.

Conceptions and opinions regarding environmental damage due to mining activities in Indonesia have illustrated many evaluations for the legal system and supervision by the government (Arsyiprameswari et al., 2021). For instance, Natasya's study, emphasizes that legal values and norms can be enforced to regulate order in matters concerning environmental preservation and sustainability. This norm is also contained in Law No. 32/2009 on Environmental Protection and Management. But even though the leadership changes from one period to the next, of course the



implementation will depend on the government, and the community in responding and being accountable for it (Arsyiprameswari et al., 2021).

Conclusion

Implementation of the nickel downstreaming policy objective, which aims to encourage economic growth, requires supervision and law enforcement. This research generates thinking as a novelty from the existence of community participation as a human right that is needed to achieve a balance of economic growth and environmental protection. This needs to be done with effectiveness and verification as well as a strong commitment from government actors and mining business actors for the purpose of the widest possible community welfare. This is by considering the recommendations in this research in the form of: a) Balance the increase in economic value and environmental protection of downstream mining programmes, especially nickel mining, which is the most attractive; b) Community participation in mining projects is not only about CSR but at the same time increasing human resources in communities that are responsive and empathetic and independent in the economy; c) Community participation creates trust between the community and the company and avoids social inequality;

On the other hand, to avoid the curse of natural resources and the consequences faced by Indonesia as a developing country in its efforts towards development requires risk mitigation. Risk governance and community participation provide knowledge and prevent future disasters due to adverse impacts that can arise from the mining process. In addition, the most important point in the process of supervising the implementation of mining business activities by companies investing in Indonesia and local companies needs to be targeted and committed to anticipate to avoid worse environmental impacts with AMDAL. In this research, it provides a concept regarding the importance of providing legal certainty and the widest possible benefits for communities in mining areas, especially by involving company decision-making. The government as an implementing actor is obliged to ensure that economic development runs without overriding environmental protection as the heart of the lives of current and future generations.

Declarations

Author contribution : Author 1: conduct the research ideas, instrument

construction, data collection, analysis, and draft writing; Authors 2 and 3: conduct the research ideas, literature review, data presentation and analysis, and the final draft. Authors 4: revised the research ideas, literature review,

data presentation and analysis, and the final draft.

Funding statement : None

Conflict of interest : The authors declare no conflict of interest.

Additional information: No additional information is available for this paper.



References

- Ali, A., Ramakrishnan, S., Faisal, F., Bazhair, A. H., Sulimany, H. G. H., & Rahman, S. U. (2024). Does escaping the natural resource curse complement evading the financial resource curse too? Empirical evidence from Indonesia. *International Review of Economics and Finance*, 91(October 2022), 539–555. https://doi.org/10.1016/j.iref.2024.01.023
- Arsyiprameswari, N., Adji, M., Utama, R., Wibowo, A., & Yuniar, V. S. (2021). Environmental Law and Mining Law in the Framework of State Administration Law. *Unnes Law Journal: Jurnal Hukum Universitas Negeri Semarang*, 7(2), 347–370.
- Aulia, M. Z. (2019). Hukum pembangunan dari Mochtar Kusuma-atmadja: Mengarahkan pembangunan atau mengabdi pada pembangunan? *Undang: Jurnal Hukum, 1*(2), 363–392. https://doi.org/10.22437/ujh.1.2.363-392
- Auty, R. (2002). Sustaining development in mineral economies: The resource curse Thesis. In *Sustaining Development in Mineral Economies*. Routledge. https://doi.org/10.4324/9780203422595
- Badan Pusat Statistik. (2024). *Ekonomi Indonesia triwulan IV-2023 tumbuh 5,04 persen (y-on-y) Badan Pusat Statistik Indonesia*. https://www.bps.go.id /id /pressrelease/2024/02/05/2379/ekonomi-indonesia-triwulan-iv-2023-tumbuh-5-04-persen--y-on-y-.html
- Badan Pusat Statistik Indonesia. (2023). Profil kemiskinan di Indonesia Maret 2023. Badan Pusat Statistik, 57, 1–8. https://www.bps.go.id/ pressrelease/2018/07/16/1483/persentase-penduduk-miskin-maret-2018-turun-menjadi-9-82-persen.html
- Bappenas. (2023). Bappenas outlines green economy and low carbon development strategy at COP 28 | Kementerian PPN/Bappenas. https://www.bappenas.go.id/en/berita/di-cop-28-bappenas-paparkan-strategi-wujudkan-transformasi-ekonomi-hijau-dan-prk-ylLjU
- Cahyaningrum, D. (2024). *Capaian investasi 2023 dan tantangan 2024.* 6, 2023–2024. Christmann, P. (2021). Mineral Resource Governance in the 21st Century and a sustainable European Union. *Mineral Economics*, 34(2), 187–208. https://doi.org/10.1007/s13563-021-00265-4
- Climate Rights International. (2023). *Indonesia: Suspend nickel mining in North Maluku Climate Rights International*. https://cri.org/indonesia-suspend-nickel-mining-in-north-maluku/
- Climate Rights International. (2024a). *CRI Indonesia report: Nickel unearthed climate rights international*. https://cri.org/reports/nickel-unearthed/
- Climate Rights International. (2024b). *Indonesia: Proyek nikel raksasa menyebabkan kerusakan lingkungan, iklim, pelanggaran HAM Climate Rights International*. https://cri.org/indonesia-proyek-nikel-raksasa-menyebabkan-kerusakan-lingkungan-iklim-pelanggaran-ham/
- Daryanti. (2025). Piramida hukum dalam mengatasi perubahan iklim dan perkembangannya. CV. Indotama Solo.
- databoks.id. (2024). *Lampaui target, realisasi investasi 2023 capai Rp1.418 triliun*. https://databoks.katadata.co.id/datapublish/2024/01/24/lampaui-target-realisasi-investasi-2023-capai-rp1418-triliun
- Direktorat Jenderal Mineral dan Batubara. (2021). *Rencana strategis direktorat jenderal mineral dan batubara tahun 2020-2024*. https://www.minerba.esdm.go.id/upload/file_menu/20220119120022.pdf



- Forest Watch Indonesia. (2023). Yang rusak karena tambang nikel Halmahera Forest Watch Indonesia. https://fwi.or.id/yang-rusak-karena-tambang-nikel-halmahera/
- Fra.Paleo, U. (2015). Risk governance: The articulation of Hazard, politics and ecology. *Risk Governance:The Articulation of Hazard, Politics and Ecology*, 1–507. https://doi.org/10.1007/978-94-017-9328-5/COVER
- Guimarães, P. (2019). Ator como forma fílmica: metodologia dos estudos atorais. Aniki: Revista Portuguesa Da Imagem Em Movimento, 6(2), 81-92. https://doi.org/10.14591/aniki.v6n2.532
- Gupta, J., & Vegelin, C. (2016). Sustainable development goals and inclusive development. *International Environmental Agreements: Politics, Law and Economics*, 16(3), 433–448. https://doi.org/10.1007/s10784-016-9323-z
- Hanson Pastran, S., & Mallett, A. (2020). Unearthing power: A decolonial analysis of the Samarco mine disaster and the Brazilian mining industry. *Extractive Industries and Society*, 7(2), 704–715. https://doi.org/10.1016/j.exis. 2020.03.
- Hudayana, B., Suharko, & Widyanta, A. B. (2020a). Communal violence as a strategy for negotiation: Community responses to nickel mining industry in Central Sulawesi, Indonesia. *The Extractive Industries and Society*, 7(4), 1547–1556. https://doi.org/10.1016/J.EXIS.2020.08.012
- Hukum Online. (2022). *Mengulas intisari teori hukum pembangunan Prof Mochtar Kusumaatmadja*. https://www.hukumonline.com/berita/a/mengulas-intisariteori-hukum-pembangunan-prof-mochtar-kusumaatmadja-lt629f18555b875/
- Indonesia.Go.Id. (2023). *Indonesia.go.id Nilai ekspor hilirisasi nikel melonjak 745%*. https://indonesia.go.id/kategori/editorial/7255/nilai-ekspor-hilirisasi-nikel-melonjak-745?lang=1
- Joneidy Efendi dan Johnny Ibrahim. (2016). *Metode penelitian hukum: Normatif dan empiris Dr. Jonaedi Efendi, S.H.I., M.H, Prof. Dr. Johnny Ibrahim, S.H., S.E., M.M., M.Hum. Google Buku*. https://books.google.co.id/books?hl=id&lr =&id= 50Z e DwAAQBAJ&oi=fnd&pg=PR5&dq=metode+penelitian+yuridis+normatif&ots=6 8a5g7y-kZ&sig=JdWUODenZRTnAhslhhJPOz9DMNU&redir_esc=y# v=onepage q=metode penelitian yuridis normatif&f=false
- Karsadi, K., & Aso, L. (2023). Multidimensional impacts of nickel mining exploitation towards the lives of the local community. *Jurnal Ilmu Sosial Dan Humaniora*, 12(2), 222–227. https://doi.org/10.23887/jish.v12i2.58881
- Kementerian Energi dan Sumber Daya Mineral. (2023a). *Kementerian Energi dan Sumber Daya Mineral Republik Indonesia siaran pers nomor:* 032.Pers/04/SJI/2023. https://www.esdm.go.id/id/media-center/arsip-berita/7-smelter-selesai-hilirisasi-terus-berjalan-sesuai-undang-undang-
- Kementerian Energi dan Sumber Daya Mineral. (2023b). *Kementerian Energi dan Sumber Daya Mineral Republik Indonesia siaran pers nomor:* 500.Pers/04/SJI/2023. https://www.esdm.go.id/id/media-center/arsip-berita/pemerintah-rencana-batasi-izin-pembangunan-smelter-nikel-kelas-ii
- Kementerian Koordinator Bidang Kemaritiman dan Investasi. (2023). Hilirisasi nikel sebagai langkah awal transformasi dan akselerasi perekonomian Indonesia. https://maritim.go.id/detail/hilirisasi-nikel-sebagai-langkah-awal-transformasi-dan-akselerasi-perekonomian-indonesia
- Krustiyati, A., & Gea, G. V. V. (2023). The paradox of downstream mining industry development in Indonesia: Analysis and challenges. *Sriwijaya Law Review*, 7(2),



- 335-349. https://doi.org/10.28946/slrev.Vol7.Iss2.2734.pp335-349
- Lahadalia, B., Wijaya, C., Dartanto, T., & Subroto, A. (2024). Nickel downstreaming in Indonesia: reinventing sustainable industrial policy and developmental state in building the EV industry in ASEAN. *JAS (Journal of ASEAN Studies)*, 12(1), 79–106. https://doi.org/10.21512/jas.v12i1.11128
- Lampert, A. (2019). Over-exploitation of natural resources is followed by inevitable declines in economic growth and discount rate. *Nature Communications*, *10*(1), 1–10. https://doi.org/10.1038/s41467-019-09246-2
- Luipert, S. (2019). *Colonial Repercussions : Namibia*. https://www.ecchr.eu/fileadmin/Publikationen/ECCHR_NAMIBIA_DS.pdf
- Maduku, D. K. (2024). How environmental concerns influence consumers' anticipated emotions towards sustainable consumption: The moderating role of regulatory focus. *Journal of Retailing and Consumer Services*, 76(October 2023), 103593. https://doi.org/10.1016/j.jretconser.2023.103593
- Milanez, B., Ali, S. H., & Puppim de Oliveira, J. A. (2021). Mapping industrial disaster recovery: Lessons from mining dam failures in Brazil. *Extractive Industries and Society*, 8(2), 100900. https://doi.org/10.1016/j.exis.2021.100900
- Nancy, N. (2022). Potential distortion of sustainable development in the conflict of interest of nickel mining and indigenous communities in. *Journal of Global Environmental Dynamics*, 3(2), 11–20.
- Narh, J. (2023). The resource curse and the role of institutions revisited. *Environment, Development and Sustainability*, 0123456789. https://doi.org/10.1007/s10668-023-04279-6
- Naryono, E. (2023). Nickel mine exploitation in Indonesia, between a blessing and a disaster of environmental damage. *Center for Open Science*, 1–22.
- Nasr-Azadani, E., Wardrop, D., & Brooks, R. (2022). Is the rapid development of visualization techniques enhancing the quality of public participation in natural resource policy and management? A systematic review. *Landscape and Urban Planning*, 228(July 2021), 104586. https://doi.org/10.1016/j.landurbplan.2022.104586
- Natarajan, U. (2012). TWAIL and the environment: The state of nature, the nature of the state, and the Arab Spring. *Oregon Review of International Law, 14,* 177–202.
- Observatory of Economic Complexity. (2024). *Nickel ore in Indonesia | The observatory of economic complexity*. https://oec.world/en/profile/bilateral-product/nickel-ore/reporter/idn
- OECD. (2022). *Sustainable Development Goals (SDGs) | OECD*. https://www.oecd.org/en/topics/sustainable-development-goals-sdgs.html
- OHCHR. (2024). *About human rights and the environment | OHCHR*. https://www.ohchr.org/en/special-procedures/sr-environment/about-human-rights-and-environment
- Olafsdottir, A. H., & Sverdrup, H. U. (2021). Modelling global nickel mining, supply, recycling, stocks-in-use and price under different resources and demand assumptions for 1850–2200. *Mining, Metallurgy and Exploration, 38*(2), 819–840. https://doi.org/10.1007/s42461-020-00370-y
- Omotehinse, A. O., & De Tomi, G. (2023). Mining and the sustainable development goals: Prioritizing SDG targets for proper environmental governance. *Ambio*, 52(1), 229–241. https://doi.org/10.1007/s13280-022-01775-3
- Patunru, A. A. (2023). Survey of recent developments: trade policy in Indonesia: between ambivalence, pragmatism and nationalism. *Bulletin of Indonesian*



- *Economic Studies*, 59(3), 1–30. https://doi.org/10.1080 /00074918.2023.2 282821
- Pouw, N., & McGregor, A. (2014). An economics of wellbeing: What would economics look like if it were focused on human wellbeing? *IDS Working Papers*, 2014(436), 1–27. https://doi.org/10.1111/j.2040-0209.2014.00436.x
- Rabinovych, M. (2019). Where economic development meets the rule of law? Promoting sustainable development goals through the European neighborhood Policy. *Brill Open Law*, 2(1), 140–174. https://doi.org/ 10.1163 /23527072-20191017
- Radhica, D. D., Ambara, R., & Wibisana, A. (2023). Proteksionisme nikel Indonesia dalam perdagangan dunia abstrak. *Cendekia Niaga Journal of Trade Development and Studies*, 74–84.
- Rahma, H., Fauzi, A., Juanda, B., & Widjojanto, B. (2021). Fenomena natural resource curse dalam pembangunan wilayah di Indonesia. *Jurnal Ekonomi Dan Pembangunan Indonesia*, 21(2), 148–163. https://doi.org/10.21002/jepi. 2021.10
- Ramina, L. (2018). TWAIL "third world approaches to international law" and human rights: Some considerations. *Revista de Investigações Constitucionais*, *5*(1), 261–272. https://doi.org/10.5380/rinc.v5i1.54595
- Rangkuti, U. I. M., Fadillah, M. R., Rafif, M. K., & Hasibuan, A. (2023). Penerapan analisis mengenai dampak lingkungan atau AMDAL sebagai pengelolaan lingkungan hidup dan sungai. *Mitra Abdimas: Jurnal Pengabdian Kepada Masyarakat*, 3(1), 17–20. https://jurnal.medanresourcecenter.org/index.php/MABDIMAS/article/view/1050
- Rao, M. (2022). A TWAIL Perspective on loss and damage from climate change: Reflections from Indira Gandhi's Speech at Stockholm. *Asian Journal of International Law*, 12(1), 63–81. https://doi.org/10.1017 /S20442513 220 00 066
- Ruppel, O. C., & Houston, L. J. H. (2023). The human right to public participation in environmental decision-making: Some legal reflections. *Environmental Policy and Law*, *53*(2–3), 125–138. https://doi.org/10.3233/EPL-239001
- Saes, B. M., & Muradian, R. (2021). What misguides environmental risk perceptions in corporations? Explaining the failure of Vale to prevent the two largest mining disasters in Brazil. *Resources Policy*, 72(July 2020), 102022. https://doi.org/10.1016/j.resourpol.2021.102022
- Santos, A. N., de Souza, G. M., Abdalla, M. M., Ferreira, A., & Nogueira, N. J. (2024). Lobbying and environmental crimes: An analysis based on the Brazilian mining sector. *Extractive Industries and Society*, *17*(January). https://doi.org/10.1016/j.exis.2024.101419
- Santoso, R. B., Moenardy, D. F., Muttaqin, R., & Saputera, D. (2023). Pilihan rasional Indonesia dalam kebijakan larangan ekspor bijih nikel. *Indonesian Perspective*, 8(1), 154–178. https://doi.org/10.14710/ip.v8i1.56383
- Statista. (2024). *Indonesia nickel mine production 2023 | Statista*. https://www.statista.com/statistics/260757/indonesian-mine-production-of-nickel-since-2006/
- Syarifuddin, N. (2022). Pengaruh industri pertambangan nikel terhadap kondisi lingkungan maritim di Kabupaten Morowali. *Jurnal Riset &Teknologi Terapan Kemaritiman*, 1, 19–23. https://doi.org/10.25042/jrt2k.122022.03
- Thorén Hedin, L., & Ranängen, H. (2017). Community involvement and development



- in Swedish mining. *Extractive Industries and Society*, *4*(3), 630–639. https://doi.org/10.1016/j.exis.2017.04.008
- UNDP. (2023). How can mining contribute to the Sustainable Development Goals? / Africa Renewal. https://www.un.org/africarenewal/news/how-can-mining-contribute-sustainable-development-goals
- Watari, T., Nansai, K., & Nakajima, K. (2021). Major metals demand, supply, and environmental impacts to 2100: A critical review. *Resources, Conservation and Recycling*, 164(August 2020), 105107. https://doi.org/10.1016/j.resconrec .2020.105107
- World Trade Organization. (2023). WTO | dispute settlement the disputes DS592: Indonesia Measures Relating to Raw Materials. https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds592_e.htm
- Wu, Y., & Tham, J. (2023). The impact of environmental regulation, Environment, Social and Government Performance, and technological innovation on enterprise resilience under a green recovery. *Heliyon*, 9(10), e20278. https://doi.org/10.1016/j.heliyon.2023.e20278
- Yakin, S. K. (2017). Analisis mengenai dampak lingkungan (amdal) sebagai instrumen pencegahan pencemaran dan perusakan lingkungan. *Badamai Law Journal*, 2(1), 113. https://doi.org/10.32801/damai.v2i1.3393
- Zanini, M. T. F., Migueles, C. P., Gambirage, C., & Silva, J. (2023). Barriers to local community participation in mining projects: The eroding role of power imbalance and information asymmetry. *Resources Policy*, 86(May). https://doi.org/10.1016/j.resourpol.2023.104283
- Zheng, S., Zhou, X., Zhao, P., Xing, W., Han, Y., Hao, H., & Luo, W. (2022). Impact of countries' role on trade prices from a nickel chain perspective: Based on complex network and panel regression analysis. *Resources Policy*, 78, 102930. https://doi.org/10.1016/J.RESOURPOL.2022.102930