Adverse impacts in the Indonesian nickel supply chain

Investor briefing on environmental, social, and legal risks in Indonesia's nickel industry: Sorowako and Morowali

September **2026**



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Swedish Society for Nature Conservation

About the authors

Source International is a non-governmental organization that works with communities dealing with environmental pollution and health problems principally caused by extractive industries. Source International provides high-level technological and scientific support free of charge to the communities with whom it works, helping them to assess the damage to the community's resources and enabling them to promote restorative actions, and trains local leaders so they can develop and promote their own environmental and social monitoring systems.

Swedwatch is an independent, non-profit research organization dedicated to promoting responsible business practices and empowering rights holders. We achieve this by exposing the human and environmental impacts of unsustainable business operations and fostering collaboration between stakeholders to drive meaningful change.

WALHI Sulawesi Selatan is the South Sulawesi branch of Wahana Lingkungan Hidup Indonesia, one of Indonesia's leading environmental advocacy organisations and part of the Friends of the Earth network. The organisation works alongside local communities to defend environmental rights, protect ecosystems and promote ecological justice in areas affected by industrial development, extractive activities and land-use conflicts.

Swedish Society for Nature Conservation (SSNC) is the largest environmental organisation in Sweden. A democratic organisation with more than 200,000 individual members. Since the start in 1909, SSNC has disseminated knowledge, monitored environmental threats, shaped public opinion, proposed solutions, and engaged in dialogue with decision-makers to influence change in areas such as climate, forests, agriculture, marine ecosystems, environmental pollutants, sustainable consumption and civic space. SSNC works with around 40 organisations in Africa, Asia, Latin America and Eastern Europe, and participates in various networks globally and within the EU.

With the cooperation of:

Friends of the Earth Japan (FoE Japan), an environmental organization that works to protect the environment and promote social and environmental justice. As a member organization of Friends of the Earth International, which has 2 million supporters in 72 countries, FoE Japan has been active in Japan since 1980. FoE Japan activities cover a wide range of topics, such as climate change, deforestation, environmental and human rights issues caused by large-scale development, nuclear power and fossil fuels.

On the cover: Nickel processing plant, Sulawesi (Indonesia). Photograph: Stefano Sbrulli/Source International

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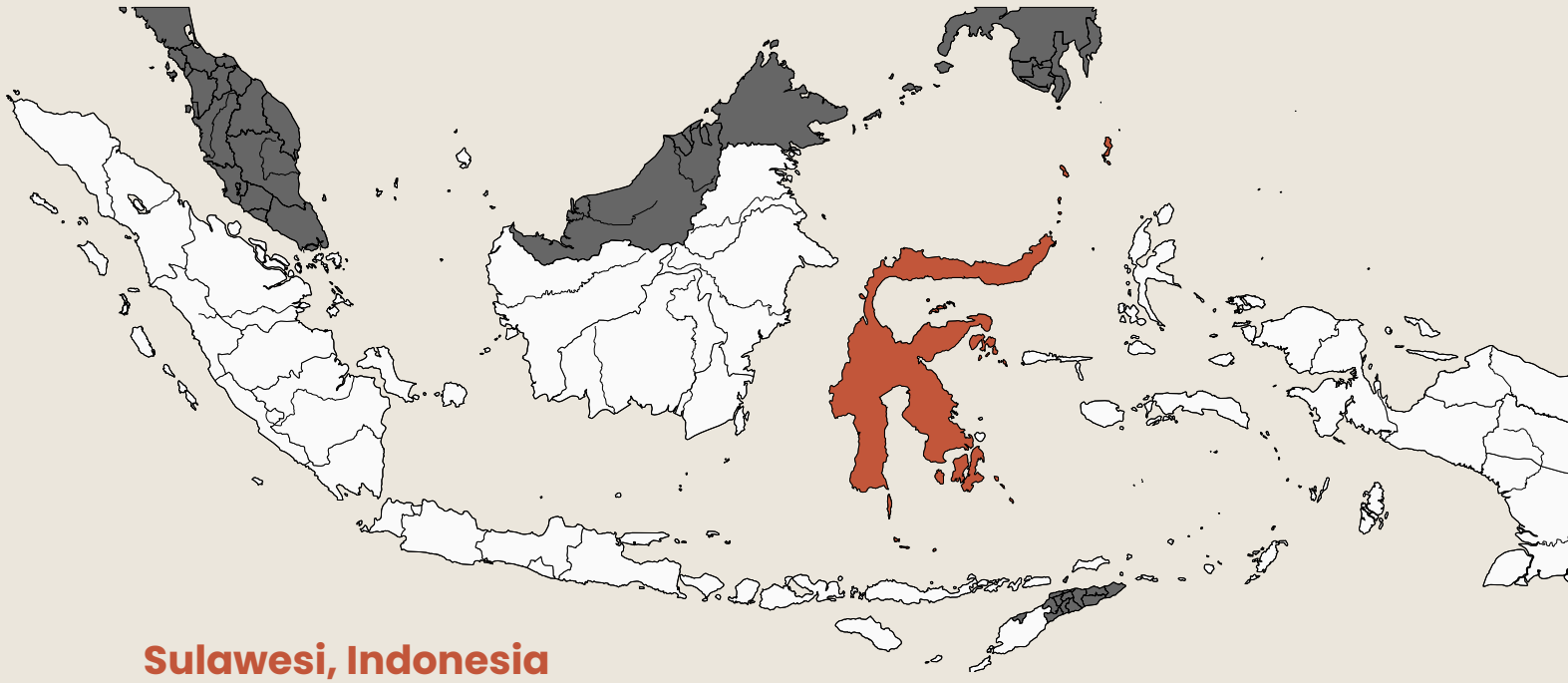
This document is based on field research conducted by Source International, Swedwatch, WALHI South Sulawesi, WALHI Central Sulawesi and Friends of the Earth Japan (May and November 2025 campaigns). It covers two of the largest nickel mining and refining operations on the Indonesian island of Sulawesi: PT Vale Indonesia Tbk in Sorowako and the PT Indonesia Morowali Industrial Park in Morowali.

The contents of this document are cross-referenced with available literature, Indonesian and international regulatory standards. Please contact Source International to report any errors.



Sulawesi, Indonesia

Executive summary

A This briefing targets two of the largest nickel operations in Sulawesi, Indonesia: **PT Vale Indonesia Tbk in Sorowako** and the **Indonesia Morowali Industrial Park (IMIP) in Morowali**. Their products have been reported to be feeding global battery supply chains, including corporate groups active in the electric vehicle (EV) sector such as BMW, Ford, Geely-Volvo, Honda, Hyundai, Kia, Mercedes-Benz, Stellantis, Tata, Tesla, Toyota and Volkswagen.[1]

B Independent monitoring campaigns found **alarming pollution in water, sediment, and air, often exceeding Indonesian legal limits and/or international guidelines** at both sites. Hexavalent chromium, a known carcinogen, and widespread heavy metal pollution, were two key issues in both areas.

C Findings also include **unresolved indigenous land dispossession** and under-compensated flooding at Sorowako, while reports from Morowali allege **patterns of behaviour seemingly consistent with forced labour** and indicate 52 recorded worker deaths between 2016 and 2024.[2]

D Companies sourcing nickel from Sulawesi, including major EV automakers, **face growing legal exposure under three binding EU instruments**. The Battery Regulation requires supply chain due diligence and consultation with affected communities. The Forced Labour Regulation can prohibit products linked to forced labour from the EU market. Large companies, in scope of the Corporate Sustainability Due Diligence Directive (CSDDD), must systematically identify, prevent, mitigate and actively address adverse impacts on human rights and the environment in their chain of activities. CSDDD also exposes companies to civil liability as well as administrative fines of up to 3% of their global turnover for noncompliance.

[1] Profundo (2025), *The Destructive Indonesian Nickel Supply Chain – A Supply Chain Mapping & Risk Assessment*; Mighty Earth (2024), *From Forests to Electric Vehicles: Quantifying and Addressing the Environmental Toll of Indonesian Nickel*; Rosa Luxemburg Stiftung (2025), *Clean Cars, Dirty Nickel – The Indonesia-China-Germay Nickel Supply Chain for EV Batteries*.

[2] China Labor Watch (2024), Work Injuries, Deaths, and Labor Protests in Select Chinese Companies in Indonesia; (2024) Forged in Silence - The Untold Stories of Chinese Workers at Indonesia's Nickel Plants.

The bigger picture:

Reduced demand through capital allocation

Demand for metals and minerals such as nickel will rise during the climate transition, driven by renewable energy and other fossil-free technologies. The demand is also affected by competition from other applications for metals and minerals, not least from a growing defence industry. While new extraction to enable the climate transition is unavoidable, the scale varies greatly depending on how the transition is implemented.

Financial actors shape both supply-side practices (extraction) and demand-side measures. Their influence through capital allocation is essential for driving systemic change toward a mining sector that operates within planetary boundaries.

By prioritizing investments in circular material flows, new technologies, resource efficiency, and infrastructure that reduces reliance on critical minerals (such as public transportation), **the financial sector can support a climate transition that is both socially equitable and environmentally sustainable**.

Methodology

Investigation on the impacts of nickel mining in Sulawesi, Indonesia

This briefing presents key issues related to two of the largest nickel mining and refining operations in Sulawesi: PT Vale Indonesia Tbk in Sorowako and PT Indonesia Morowali Industrial Park (IMIP) in Morowali. It includes the results of a human rights and environmental assessment conducted by Source International, Swedwatch, Friends of the Earth Japan, WALHI South Sulawesi and WALHI Central Sulawesi in May and November 2025.

Swedwatch performed semi-structured interviews and focus group discussions with workers, trade union representatives, Indigenous peoples and members of communities affected by nickel mining and operations in Sorowako and Morowali. The discussions explored impacts on livelihoods, access to water, health, the environment, land rights, labour rights and Indigenous peoples' rights.

Source International carried out an independent assessment of environmental contamination relying both on field instruments and analyses by accredited laboratories. They quantified heavy metals in water, sediments, and airborne dust along with particulate matter and potentially harmful gases in air. Results were compared with Indonesian legal standards or, if not available, international guidelines.

The full set of results *will be published in separate, in-depth reports, soon to be found on Swedwatch's and Source International's websites.*



Sorowako
PT Vale Indonesia Tbk

PT Vale Indonesia Tbk, formerly PT INCO, operates in Sorowako since 1978, with a vast open-pit extraction and a pyrometallurgic smelter. Its mining licence spans 70,000+ hectares. It is currently developing a High-Pressure Acid Leach (HPAL) system to produce materials for batteries.

The Sorowako area includes the ancient lakes Matano and Mahalona, and villages such as Sorowako, Nikkel, Asuli and Tole. The ancestral land of the Karunsi'e Indigenous people overlaps with PT Vale's concession.



PT Vale Indonesia Tbk Industrial area in Sorowako, Sulawesi (Indonesia).
Photograph: Stefano Sbrulli/Source International

1 **Naturally-occurring heavy metals can be released by mining activities.** The area's geology is naturally rich in some elements, such as chromium and nickel. Superficial and extensive mining, combined with frequent, intense rain, could cause these elements to disperse and pollute the surrounding environment.

2 **Illegal levels of hexavalent chromium.** Hexavalent chromium, a certain human carcinogen, was above the Indonesian legal limits at multiple locations. Two sites in Nikkel village, downstream the main Sorowako mining area, were up to 3 times higher. A stream feeding into Lake Matano, under the access road connecting the Petea block with the main mining area, showed a hexavalent chromium concentration of 530 µg/L in November 2025, more than ten times the legal limit of 50 µg/L.

3 **Heavy metal contamination in water and sediments.** High levels of manganese and nickel were found in the water of Lakes Matano and of rivers in the area. Sediments also revealed persistent and concerning concentrations of nickel, chromium and cobalt throughout the area. Chromium surpassed the Canadian threshold[3] up to 40-fold. These pollutants are associated with a well-documented range of adverse effects on human health and aquatic ecosystems.

4 **Pollution in conservation areas.** Lake Matano is formally recognized as a global Key Biodiversity Area due to its richness in endemic species.[4] Its systematic contamination poses a serious risk to its preservation.

5 **Monitoring gap.** PT Vale's 2024 sustainability report states that its 11 wastewater monitoring points in Sorowako recorded no exceedances all year.[5] Source International's independent results diverge from this finding, raising concerns about the comprehensiveness of due-diligence assessments that rely exclusively on company-reported data.

[3] Canadian Environmental Quality Guidelines: commonly used, in literature, when a national normative is missing.

[4] World Database of Key Biodiversity Areas, 'Feruhumpenai - Matano (16384)' (accessed 09 September 2026).

[5] PT Vale Indonesia Tbk (2024), Sustainability Report (accessed 09 March 2026).

6 **Disputed water quality in Asuli village.** Independent tests conducted on the community water source in the village of Asuli in 2022/2023 revealed levels of hexavalent chromium above the WHO drinking water guidelines.[6] While tests in 2025 showed values below, mining activities close to the residential area risk mobilizing the metal-rich soil into the water.

7 **Indigenous land rights unresolved.** The Karunsi'e Dongi indigenous community, whose displacement begun with the starting of mining operations in the 1970s, still disputes rights to its ancestral land. Interviews with community leaders found ongoing tension despite decades of partial compensation. In 2023, PT Vale attempted to remove residents from the previously agreed resettlement area of Old Camp and, as a result, was reported to Indonesia's Human Rights Commission for alleged human rights violations, intimidation, and criminalization of community members.[7]

8 **Uncompensated flooding.** PT Vale's control of Sorowako catchment's dam system has repeatedly flooded the rice fields on the shores of Lake Mahalona, most recently in June 2025. According to interviews with the community, the company paid roughly 50% of claimed losses for the latest incident (about US$16,000 in total), but declined to characterize it as formal compensation, describing the payment as "humanitarian support" or "fund for farmers".

9 **Expansion lacking adequate prior consultation.** PT Vale's expansion plans in the Tanamalia block, inhabited by pepper-farming communities, have proceeded without adequate prior consultation, accompanied by a documented presence of military and heavily armed police during prospection activities. Residents interviewed by Swedwatch reported having difficulties in getting hold of information about the company's plans and a lack of a genuine dialogue over the future of their area and livelihoods.

[6] Friends of the Earth Japan (2023), *'Protecting the Basic Human Rights of Communities Impacted by the Sorowako Nickel Development in Indonesia! – Request Submitted to Major Shareholders of Vale for Appropriate Action to Prevent Complicity in Human Rights Abuses (Endorsed by 104 Organizations from 23 Countries over the World)'* (accessed 09 March 2026).

[7] Business and Human Rights Centre, *'Sorowako Residents Reported PT Vale Indonesia to The Human Rights Commission for Alleged Human Rights Violation'* (accessed 17 April 2026).



Morowali

PT Indonesia Morowali Industrial Park (PT IMIP)

PT IMIP hosts 50+ tenant companies, the majority linked to the Chinese Tsingshan Group, with more than 100,000 workers. Since its establishment in 2013, it grew to cover 5,500 hectares, once occupied almost exclusively by forests and fishing villages. It now includes 15 smelters and 18 coal-fired power plants for a total of 5.5 GW.

The rapid industrialization of the area outpaced the development of essential services such as waste management, healthcare, education or public utilities in Labota, Bahodopi, Fatufia, Bahomakmur and other villages.



Seawater and air pollution in the Morowali area, Sulawesi (Indonesia). Photograph: Stefano Sbrulli/Source International

1 **Illegal levels of air pollution.** Fine particulate matter, $PM_{2.5}$, exceeded the Indonesian legal limits at 2 out of 3 tested sites in November 2025. All sites surpassed the WHO guidelines, with hourly peaks over 10 times the threshold.[8] High levels of $PM_{2.5}$ are linked to respiratory, cardiovascular, and cognitive problems, up to respiratory mortality and hearth failure for prolonged exposures. Air quality during the dry season is expected to be worse, since the assessment took place in rainy days and rain has a cleaning effect on airborne pollutants. Contributing to the issue, IMIP powers its operations with huge coal power plants, for a total of 5.5 GW.

2 **Water and sediment contamination above thresholds.** Water collected from a river engulfed by PT IMIP's industrial area and flowing into the ocean showed illegal levels of nickel, copper and selenium, as well as a manganese concentration of 11,000 µg/L, 110 times larger than the legal limit. Sediments from the same location also had arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc above Canadian guidelines.[9] Seawater samples had manganese over 3 orders of magnitude higher than the typical oceanic backgrounds.

3 **Government-announced sanctions.** In June 2025, the Indonesian Ministry of Environment announced sanctions against PT IMIP after a government survey found illegal levels of particulate matter, 24 unmonitored emissions sources, a missing communal wastewater treatment plant and over 10 hectares (an estimated 12 million tons) of illegal tailings.[10]

4 **Community health impacts.** Local health authorities recorded 55,527 cases of acute respiratory infections in 2023 in the area surrounding PT IMIP, including hundreds of pneumonia cases in adults and infants.[11] Teachers at a school near a coal plant chimney report schoolchildren suffering fatigued breathing and headaches.

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[8] While the WHO guidelines do not explicitly prescribe hourly thresholds, the Agency for Toxic Substances and Disease Registry acknowledged the possibility of comparing hourly averages with daily reference guidelines for $PM_{2.5}$ and PM_{10} for screening and evaluation purposes.

[9] See note 3.

[10] Antara News, *'Langgar Aturan Lingkungan, KLH Akan Sanksi PT IMIP Di Morowali'*, 18 June 2025 (accessed 19 April 2026).

[11] Kiki Sanjaya *et al.* (2024), *Analysis of Environmental Health Risks Due to Exposure to PM10, PM2.5, and SO2 in Fatufia, Bahomakmur, and Labota Village Communities*.

5 **Impacts on local economy.** A large amount of sediment-filled wastewater flows out of PT IMIP and into the sea, causing a clearly visible increase in turbidity for hundreds of meters from the coast. Local fishermen interviewed by Swedwatch reported that, as a result of this turbidity, catches collapsed and operational costs rose, forcing many out of the trade.

6 **Allegations consistent with forced-labour indicators.** Reports from China Labor Watch suggest that the Chinese workforce at PT IMIP could be facing passport withholding, restrictions of movement, and punitive wage deductions.[12] These indicators form a pattern seemingly consistent with the International Labour Organization (ILO)'s definition of forced labour under Convention No. 29, ratified by Indonesia. In 2024, the US Department of Labor added Indonesian nickel to its list of goods potentially tainted by forced labour.[13]

7 **Recurring fatal incidents.** A database curated by China Labor Watch recorded 52 deaths and 78 injuries at PT IMIP between 2016 and 2024, including 21 workers killed in a December 2023 furnace explosion, after cuts to maintenance downtime, and 3 workers killed in a tailings facility collapse in March 2025. The PT IMIP clinic staff described workplace accidents as a daily occurrence.[14]

[12] China Labor Watch (2024), *Forged in Silence - The Untold Stories of Chinese Workers at Indonesia's Nickel Plants* (accessed 23 January 2026); China Labor Watch (2023), *Compounding Vulnerabilities: Chinese Workers in Indonesia*.

[13] Business and Human Rights Centre, *'Indonesia: US Department of Labor Adds Nickel to Forced Labour List for 2024; Includes Responses from Advocates and Indonesian Government Officials'*, 1 October 2024 (accessed 23 April 2026).

[14] China Labor Watch, *Work Injuries, Deaths, and Labor Protests in Select Chinese Companies in Indonesia*, 4 November 2024 (accessed 27 January 2026); Diana Mariska and A. Anantha Lakshmi, *'"Production First, Safety Later": Inside the World's Largest Nickel Site'*, Indonesia, Financial Times, 28 November 2024 (accessed 27 January 2026).

Legal exposure **in the EU** for involved companies

1. **At least three EU legal instruments impose due diligence for certain companies**. The Corporate Sustainability Due Diligence Directive (CSDDD, 2024/1760) applies to all large companies within its scope, including EV automakers, battery manufacturers and resellers. The Battery Regulation (2023/1542) and the Forced Labour Regulation (2024/3015) are more targeted instruments, applying specifically to battery supply chains and products made with forced labour, respectively.

2. **Indirect business partners still count.** The CSDDD's definition of a "business partner" explicitly includes indirect, upstream relationships in the chain of activities, such as nickel suppliers.

3. **Available information must be considered under CSDDD.** The CSDDD's mandatory scoping exercise to identify risk areas must use "reasonably available information". Information about the impacts of nickel mining at Sorowako and Morowali is plentiful and has been documented extensively. Said reports have also already been shared with Members of the European Parliament.

4. **Non-compliance with the CSDDD may result in financial penalties and reputational consequences.** Penalties may be imposed for failures to comply with the due diligence obligations under the directive. Member States must set a maximum fine of 3% of a company's net worldwide turnover. If a company fails to comply with a decision imposing a financial penalty, a public statement indicating the company responsible and the nature of the infringement shall also be issued.

5 **Traceability will be necessary by law**. The Battery regulation will require traceability of batteries entering the EU market, down to raw material extraction, and due diligence throughout the supply chain, starting from August 18, 2027.

6 **Forced labour products banned from EU market.** The Forced Labour Regulation, applicable from December 14, 2027, will prohibit goods tainted by forced labour to enter the EU market. The European Commission, bearing the burden of proof, may decide to investigate the allegations at PT IMIP given the available documentation and the United States' inclusion of Indonesian nickel in the list of forced labour goods.

Key risks

- **Legal**: overlapping exposure under three EU legal instruments; forced-labour findings can trigger outright product bans, not just fines.
- **Financial**: the CSDDD prescribes fines up to 3% global turnover for failure to perform due diligence; Battery Regulation and Forced Labour Regulation carry EU market-access risk from 2027.
- **Reputational**: findings are public, come from reputable sources, and have already been briefed to Members of the European Parliament.
- **Operational**: recurring fatal incidents, government-announced sanctions and unresolved land disputes point to governance gaps that can disrupt supply.

Timeline of legal exposure in the EU

18 August 2027
Start of Battery Regulation's due diligence obligations

14 December 2027
Forced Labour Regulation starts being enforced

26 July 2029
Start of CSDDD's due diligence obligations

Recommendations for investors

Investors should use their leverage with mining companies, industrial park operators, battery manufacturers, automotive companies and other portfolio companies linked to Indonesian nickel to ensure the following actions:

1 **Conduct robust human rights and environmental due diligence across the value chain.** Investors should require portfolio companies to identify, prevent and address severe human rights and environmental risks across the full value chain, including risks associated with Indonesian nickel. This includes pollution, biodiversity loss, climate impact, labour rights and safety, Indigenous peoples' rights and impacts on local livelihoods.

2 **Ensure responsible sourcing, meaningful participation and respect for rights.** Investors should require portfolio companies to establish effective traceability and transparency of nickel supply chains and ensure meaningful engagement with affected local communities and rights holders. This includes respect for Indigenous peoples' rights to land, resources and culture and to implement free, prior and informed consent (FPIC) in line with international standards.

3 **Ensure prevention, remediation and access to remedy.** Investors should require portfolio companies to take timely action where serious environmental or human rights impacts are identified, including independent monitoring, pollution prevention, restoration and effective remedy. Companies should provide accessible grievance mechanisms and ensure that affected workers and communities can obtain appropriate remedy, including compensation, restitution, health support and livelihood restoration where relevant.

4 **Set clear expectations, monitor progress and escalate when necessary.** Investors should establish time-bound expectations and measurable indicators for responsible sourcing, human rights, environmental performance and remedy, and regularly assess portfolio companies' progress. Where companies fail to address serious risks or demonstrate meaningful improvement, investors should use available leverage, including active engagement, voting, shareholder resolutions and collaboration, and, where necessary, reconsider continued investment.

5 **Support a just and resource-efficient transition.** Investors should align the capital allocation with a transition that reduces dependence on primary extraction through circularity, recycling, resource efficiency, lower-material-intensity solutions and development of infrastructure (such as public transportation) that reduces reliance on critical minerals.



Tailings disposal in Sorowako, Sulawesi (Indonesia).
Photograph: Stefano Sbrulli/Source International

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