

CRITICAL FOR WHOM?

Tin Mining, Human Rights and the Green Transition in Indonesia

Report #108

SWEDWATCH

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WALHI Babel is the Bangka Belitung Islands 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.

This report was authored by Swedwatch in collaboration with SSNC and WALHI.

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Executive summary

The Bangka Belitung Islands in Indonesia supply around one fifth of the world's tin, a mineral essential to electronics and green technologies such as electric vehicles and solar power. Tin has been mined here for three centuries. This report shows that, for the communities living with its extraction, the costs remain severe and largely unaddressed.

Swedwatch carried out on-site research in November 2025 together with Wahana Lingkungan Hidup Indonesia (WALHI), one of Indonesia's leading environmental organisations and part of the Friends of the Earth network. Drawing on focus groups with young people, interviews with community members, small-scale fishers, farmers, miners, Indigenous representatives and experts, and site visits to land-based and off-shore mining areas, the research documents serious harm on land and at sea.

Onshore and offshore mining have degraded mangroves, seagrass meadows and coral reefs, depleting fish stocks and undermining food security and coastal livelihoods. On land, mining has left thousands of unreclaimed pits, destroyed agricultural soil and fuelled conflict within communities.

As traditional livelihoods decline, often because of the environmental impacts from the tin mining, more people have to turn to mining. Child labour persists, particularly in informal mines, exposing children to hazardous work and disrupting their education. Interviewees described sexual harassment and exploitation of girls and young women, including trafficking, as well as increased substance abuse among miners.

Participants reported that mining permits are often issued without informing or consulting affected communities, leaving them little say over decisions affecting their land, coast and future. Widespread illegal mining, highlighted by a major corruption case involving the state-controlled producer PT Timah, further undermines oversight and traceability.

Through their disclosed smelter and refiner lists, the report links tin production in Bangka Belitung to four global companies: the Swedish Telefonaktiebolaget LM Ericsson, the US Apple Inc. and Tesla Inc., and the German Volkswagen AG (referred to hereafter as Ericsson, Apple, Tesla and Volkswagen Group respectively). All four were asked about their due diligence. Only Ericsson provided substantive written answers, acknowledging limitations in its ability to trace tin in its products to mine level.

Recommendations

Addressing the human rights and environmental risks documented in this report requires action by both states and businesses. Under international human rights law, the Government of Indonesia is the primary duty bearer. It is obliged to protect people against business-related human rights abuses, through effective regulation, enforcement and access to remedy. While acknowledging this fundamental responsibility, the following recommendations are directed at other actors associated with the Indonesian tin value chain. The states where multinational companies are based, including the EU and its member states such as Sweden, are expected to make clear, including through legislation, that these companies must respect human rights throughout their supply chains. Companies that source tin have a direct responsibility to identify, prevent, mitigate and address harm in their supply chains, in line with the United Nations (UN) Guiding Principles on Business and Human Rights (UNGPs) and the Organisation for Economic Co-operation and Development (OECD) Due Diligence Guidance for Responsible Mineral Supply Chains. Investors, to whom UNGPs also apply, hold significant leverage over the companies they finance and hold stakes in, and are expected to ensure that their portfolios do not contribute to, or benefit from, human rights and environmental abuse. The following recommendations are directed at the EU, the Swedish government, companies sourcing minerals, and investors.

Recommendations for the EU and the Swedish Government

- Ensure that EU critical raw materials partnerships and strategic projects require robust and ongoing human rights and environmental due diligence, community consultation and remedy, and that this extends to offshore mining.
- Ensure that national transposition of the EU Directive on corporate sustainability due diligence (CSDDD) provides for effective human rights and environmental due diligence across upstream mineral supply chains and access to justice, remedy and compensation for affected communities and rights holders.
- Assess whether the scope, implementation and enforcement of the EU Conflict Minerals Regulation adequately address the human rights and environmental risks associated with tin sourcing at Bangka-Belitung, and strengthen EU measures where gaps are identified.
- Through development cooperation and diplomacy, support Indonesian civil society, including environmental and human rights defenders, in monitoring the mining sector.

Recommendations for companies sourcing minerals

Conduct ongoing human rights and environmental due diligence (HREDD)

- Carry out meaningful, robust and ongoing HREDD to identify, prevent, mitigate and provide remedy for adverse impacts of business operations on the environment and rights of affected communities.

- Based on robust HREDD efforts, prioritise and address salient risks, including but not limited to those identified in this report.
- Extend HREDD processes beyond tier-one suppliers to include smelters and upstream mining operations, including consulting with experts and affected stakeholders to identify the drivers of risk.

Apply a gender-responsive approach to business practices

- Integrate gender-responsive HREDD throughout business practices by consulting affected women and women's organisations and defenders, including in mining communities and communities close to mines.
- Use leverage to require smelters and suppliers to address sexual harassment, exploitation and gender-based violence as severe risks requiring priority action.
- Ensure gender-sensitive remedies through grievance mechanisms designed in collaboration with affected women that tackle root causes and protect complainants from reprisals.

Ensure full supply chain traceability and transparency

- Given the documented problem with illegal mining, and the mixing of legal and illegal tin in Indonesia, companies must ensure traceability and map their supply chains down to mine level, not only smelters.
- Require suppliers to publicly disclose smelter lists, sourcing regions, and risk assessments.
- Support independent traceability systems rather than relying solely on industry self-reporting.

Meaningfully engage with affected communities and workers

- Ensure meaningful engagement with affected communities and workers in line with international standards on public access to information and participation.
- Establish accessible, safe, and effective grievance mechanisms for workers and communities.
- Ensure remediation for harm, including compensation for loss of access to land, environmental restoration, and livelihood support.
- Refrain from solely outsourcing HREDD obligations to auditing services and certification schemes but instead complement these with on-the-ground assessments and dialogues, unannounced visits, and independent investigations.

Actively support ecosystem restoration

- Regularly assess both onshore and offshore mining impacts and support the long-term restoration of mangroves, seagrass meadows, coral reefs and other critical ecosystems, in line with the OECD Handbook on Environmental Due Diligence in Mineral Supply Chains and the UN Decade on Ecosystem Restoration's Standards of Practice to Guide Ecosystem Restoration.

- Require effective post-mining reclamation, including closing pits, based on community participation and their prioritisation.
- Avoid sourcing from mining in ecologically sensitive or protected areas.

Contribute to the elimination of child labour across business activities

- Adopt and implement policies to prevent and eliminate child labour across business activities and relationships in line with the Children's Rights and Business Principles developed by the United Nations Children's Fund (Unicef), the UN Global Compact and Save the Children.
- Integrate children's rights into due diligence to protect children at and around mining sites from accidents, hazardous substances, violence, sexual abuse and exploitation. This includes assessing the different risks faced by girls and boys.
- Provide for, or cooperate in, the remediation of adverse business impacts on children through grievance mechanisms that prioritise the best interests of children.

Recommendations for investors

Investors should use their leverage with mining companies and other portfolio companies linked to Indonesian tin to ensure the following actions:

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 tin. This includes pollution, degradation of coastal and terrestrial ecosystems, child labour, occupational health and safety, sexual harassment and exploitation, Indigenous peoples' rights, impacts on local livelihoods and lack of post-mining land rehabilitation. Due diligence should also address corruption and the mixing of legally and illegally mined tin.

Ensure responsible sourcing, meaningful participation and respect for rights

- Investors should require portfolio companies to establish effective traceability and transparency of tin 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. Engagement should enable the meaningful participation of women, young people, fishers, farmers and other groups affected by onshore and offshore mining.

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, restoration and effective remedy. Companies should provide acces-



Tin mining takes place both on land and at sea around the Bangka-Belitung Islands. At sea, miners use large dredging vessels as well as smaller mining pontoons, like those in the photo. Both licensed and illegal mining have been reported on land and in the waters around the islands.

sible, safe and effective grievance mechanisms and ensure that affected workers and communities can obtain appropriate remedy, including compensation, restitution, health support and livelihood restoration where relevant. This includes reclamation of abandoned mining pits, restoration of mangroves, seagrass meadows and coral reefs, and child-sensitive remediation that supports access to education and protects children from further exploitation.

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.

Support a just and resource-efficient transition

- Investors should align capital allocation with a transition that reduces dependence on primary extraction through circularity, recycling, resource efficiency, and lower-material-intensity solutions that reduce reliance on critical minerals such as tin.

Introduction

Minerals are fundamental to the global economy, underpinning a wide range of technologies, industries and infrastructure that shape modern society. They are used in products and systems ranging from smartphones, computers and data centres to batteries, electric vehicles and renewable-energy technologies. Minerals such as lithium, cobalt, nickel and copper play particularly important roles in the green and digital transitions and are therefore commonly referred to as critical raw materials, or simply critical minerals. Tin, while not currently officially classified by the EU as a critical raw material, remains essential to the production and functioning of many technology products.

According to the International Energy Agency (IEA), the demand for minerals required for low-carbon technologies could more than double by 2030 in a scenario aligned with global climate goals.[1] In parallel, critical raw materials are also recognised as strategically important for industrial competitiveness, technological innovation, economic security and defence applications, meaning that these resources have become an increasingly important geopolitical issue. Taken together, resource-rich countries are today at the centre of the global economic landscape. For example, major economies such as the European Union and the United States, have introduced industrial, trade and climate policies aimed at securing reliable supplies of minerals considered essential for the energy transition and future economic competitiveness.[2]

While the extraction of critical minerals is often presented as essential to enabling the green transition and supporting economic development, mining has repeatedly been associated with significant environmental, social and human-rights impacts.[3] Across the world, mining projects have contributed to deforestation, biodiversity loss, water pollution, and land degradation. Mining activities have also been linked to displacement of communities, loss of livelihoods, adverse impacts on Indigenous Peoples' rights, unsafe working conditions, child labour, gender-based violence and reprisals against environmental and human-rights defenders.[4]

As demand for minerals continues to increase and some land-based deposits become more difficult or costly to access, mining activities are also expanding into coastal and marine environments.[5] Offshore and nearshore extraction is increasingly being promoted as a potential source of minerals needed for future technologies and energy systems.[6] However, mining in the ocean introduces a new set of environmental and social risks that remain insufficiently understood and poorly regulated in many contexts.

This is particularly relevant in the case of tin, a mineral that is critical for the electronics industry and increasingly important for the green energy transition. Tin is widely used in solders that connect electronic components and is therefore essential to products such as smartphones, computers, renewable-energy technologies and electric vehicles. In Indonesia, one of the world's largest tin producers, extraction takes place both on land and increasingly in coastal and offshore environments.[7] Research has documented how mining at coasts impacts biodiversity negatively, and how offshore tin mining can damage ecosystems, reduce fish stocks and undermine

the livelihoods of communities dependent on fisheries and coastal resources.[8] These impacts have important implications not only for biodiversity and climate resilience but also for a range of human rights linked to food security, health, culture and livelihoods.

The growing importance of minerals has led to increased scrutiny of how minerals are sourced and produced. International standards increasingly emphasise that mineral extraction must be carried out in a manner that respects human rights, protects ecosystems and ensures meaningful participation of affected stakeholders. The UNGPs establish the duty of states to protect against business-related human-rights abuses and the responsibility of companies to identify, prevent, mitigate and remedy adverse impacts throughout their operations and supply chains.[9] Similar expectations are reflected in the OECD Guidelines for Multinational Enterprises on Responsible Business Conduct and the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas with mineral-specific recommendations in the Supplement on Tin, Tantalum and Tungsten.[10]

Alongside these international standards, EU legislation is establishing binding requirements relevant to responsible mineral sourcing. These include the EU Conflict Minerals Regulation and the Corporate Sustainability Due Diligence Directive (CSDDD), complemented by the Forced Labour Regulation's prohibition on products made with forced labour and the Batteries Regulation's due diligence requirements for specified raw materials used for batteries.[11]

Together, international standards and applicable legislation affirm that states have a duty to protect against human rights abuses and environmental harm, including by regulating business conduct and ensuring access to effective remedy. Businesses have an independent responsibility to respect human rights by preventing and mitigating adverse impacts, engaging meaningfully with affected stakeholders, providing access to information and consultation, and enabling or cooperating in remediation when harm occurs, as outlined more specifically under the OECD Due Diligence Guidance for Meaningful Stakeholder Engagement in the Extractive Sector. As demand for critical minerals continues to grow, implementation of these standards and legislations will play an increasingly important role in determining whether the green transition can be achieved in a manner that is just, equitable and sustainable.

The report first introduces tin's role in global supply chains and the context of mining in Indonesia's Bangka Belitung Islands. It then presents Swedwatch's findings on environmental and human rights impacts, drawing on affected communities' experiences and perspectives. Finally, it outlines companies' responsibilities under international standards, reviews the responses of Apple, Ericsson, Tesla and Volkswagen Group, and draws conclusions. Recommendations for companies, investors and governments are presented at the beginning of the report.

Methodology

This report is based on on-site research, a review of secondary data, and outreach to and engagement with companies involved in the tin supply chain. Together with WALHI (Friends of the Earth Indonesia, Indonesia's largest and oldest environmental NGO), Swedwatch's research team conducted interviews and site visits to two land-based tin mines and two offshore tin mining areas in Bangka-Belitung in November 2025.

Swedwatch conducted four qualitative focus group discussions with young people from mining-affected communities in Pangkalpinang. The discussions included 24 people between ages 18 and 28 from communities across the island (12 men and 12 women). Each discussion lasted approximately three hours and focused on participants' experiences of how tin mining affects their communities, livelihoods, environment and future opportunities, as well as their views on measures needed to reduce harm and protect affected ecosystems and communities. Most participants were university students studying law, economics, sociology and education, while others worked as farmers, fishers and firefighters. Almost all male participants had worked in tin mining, and all participants reported having family members who currently or previously depended on mining for their livelihoods.

To complement the focus groups, Swedwatch conducted 24 one-to-one interviews with community members, fishers, farmers, miners and representatives of Indigenous communities, exploring how mining affects livelihoods, local ecosystems, access to land and water, and social dynamics within mining-affected communities. The research was further informed by six expert interviews with academics specialising in child labour and coastal and marine ecosystems within Bangka Belitung and one expert interview with a journalist who has covered mine sites across Indonesia for 15 years as well as dialogues with key informants at WALHI Kepulauan Bangka Belitung.

Based on the research findings, Swedwatch contacted four companies that have disclosed smelters and refiners in Bangka Belitung as part of their tin supply chains: Tesla and Volkswagen Group from the automotive industry, and Apple and Ericsson from the technology sector. Each company received a set of questions anchored in international frameworks around business and human rights and Swedwatch's findings.

How does tin matter for technology and the green energy transition?

Tin is a metal of critical importance to the Information and Communication Technology (ICT) sector, and a growing pillar for the green energy transition. Its most widespread use, roughly half of global tin demand, is in solders, the low-melting alloys that bind and electrically connect components on printed circuit boards (PCBs) and other electronic assemblies. These solders are for example found in smartphones, computers and digital infrastructure.[12]

Tin's strategic value is projected to grow further as global demand for green technologies expands. According to resource-outlook analyses, minerals including tin are increasingly regarded as critical for manufacturing renewable-energy infrastructure, electronics, and other decarbonisation technologies.[13] For example, tin is essential in the electronics that underpin electric vehicles (EVs), renewable-energy systems, battery management systems, power inverters, and solar-panel electronics.[14]

As demand for electronics, electric vehicles and renewable-energy technologies continues to grow, so does the need for tin. Although often overlooked in discussions about critical minerals, tin is essential to modern technology. Without tin, many of the technologies underpinning both the digital economy and the green-energy transition would not function.

Tin's strategic importance is further reinforced by the concentration of global supply in a limited number of producing countries. Indonesia is one of the world's largest tin producers and exporters, accounting for roughly one fifth of global production in recent years. Together with China and Myanmar, it plays a central role in supplying the global electronics industry. This means that environmental and human-rights risks associated with tin mining in Indonesia can have implications throughout international value chains.

Tin mining in Indonesia

This section outlines the context of Indonesia's tin industry and the Bangka Belitung Islands, a region central to global tin production. It highlights key environmental, social and governance issues linked to the sector and reviews developments in recent years that have drawn increased scrutiny to the country's tin trade. Understanding this context is essential for assessing risks within supply chains.

Bangka Belitung Islands

Off the coast of Sumatra lie the Bangka Belitung Islands: the epicentre of Indonesia's tin mining and a vital contributor to the global tin industry. In 2021, Indonesia mined 83,000 tons of tin, making up 26 percent of the world's total production, ranking second only to China. Although production has fluctuated since then, Indonesia is still ranked as a top exporter of tin. Bangka Belitung alone contributes with 90–95 percent of the production.[15]

Tin extraction has been going on for 300 years, and has over the years been vital to local economies, but it has come at enormous environmental cost. According to estimates more than 12,000 open pits scar the land, leaving some regions with a moonlike landscape. Many of these abandoned pits have been filled with water contaminated by acid mine drainage and heavy metals, creating artificial ponds that often appear in striking shades of turquoise, green and red. The lack of adequate remediation has left thousands of such scars across the landscape.[16] With the significant rise in tin extraction from the seafloor, new impacts have emerged that alter marine ecosystems and biodiversity in the area.[17]




Left: A miner sprays water to loosen tin-rich sand and other sediment. The practice is dangerous because it can trigger sudden landslides. Right: Miners wash the sediment to separate the heavier tin ore from the lighter sand.

Scholars, civil society organisations and journalists have for over a decade documented extensive land degradation, loss of mangroves, destruction of coastal and terrestrial ecosystems, and damage to traditional livelihoods and problems with illegal mining.[18] Post-mining land reclamation has been inadequate: less than 10 percent of land degraded by illegal mining had been reclaimed in 2023.[19] Mining has also encroached on agricultural lands, undermining traditional economies and reducing ecological resilience.[20] These historical patterns of extraction and their associated environmental and social impacts provide important context for understanding current discussions around tin mining in the region.

Indonesia's tin industry and links to multinational companies

Tin mined on land and offshore in Bangka Belitung enters international supply chains through collectors, traders, smelters and refiners. Once processed, the metal is used in solder and electronic components that are incorporated into products such as smartphones and vehicles. Multinational companies are therefore connected to mining through several tiers of suppliers (see Figure 1). Apple and Ericsson, from the technology sector, and Tesla and Volkswagen Group, from the automotive industry, are four examples of global companies that have publicly listed smelters and refiners in Bangka Belitung within their tin supply chains. These disclosures establish links to the region's tin industry, although they do not trace the tin in individual products to specific mines or confirm sourcing from the particular sites visited for this research.

At the centre of Indonesia's tin industry stands PT Timah Tbk, a state-controlled company and one of the world's largest tin producers, whose operations span tin exploration, mining, smelting and the sale and export of tin metal. PT Timah is a

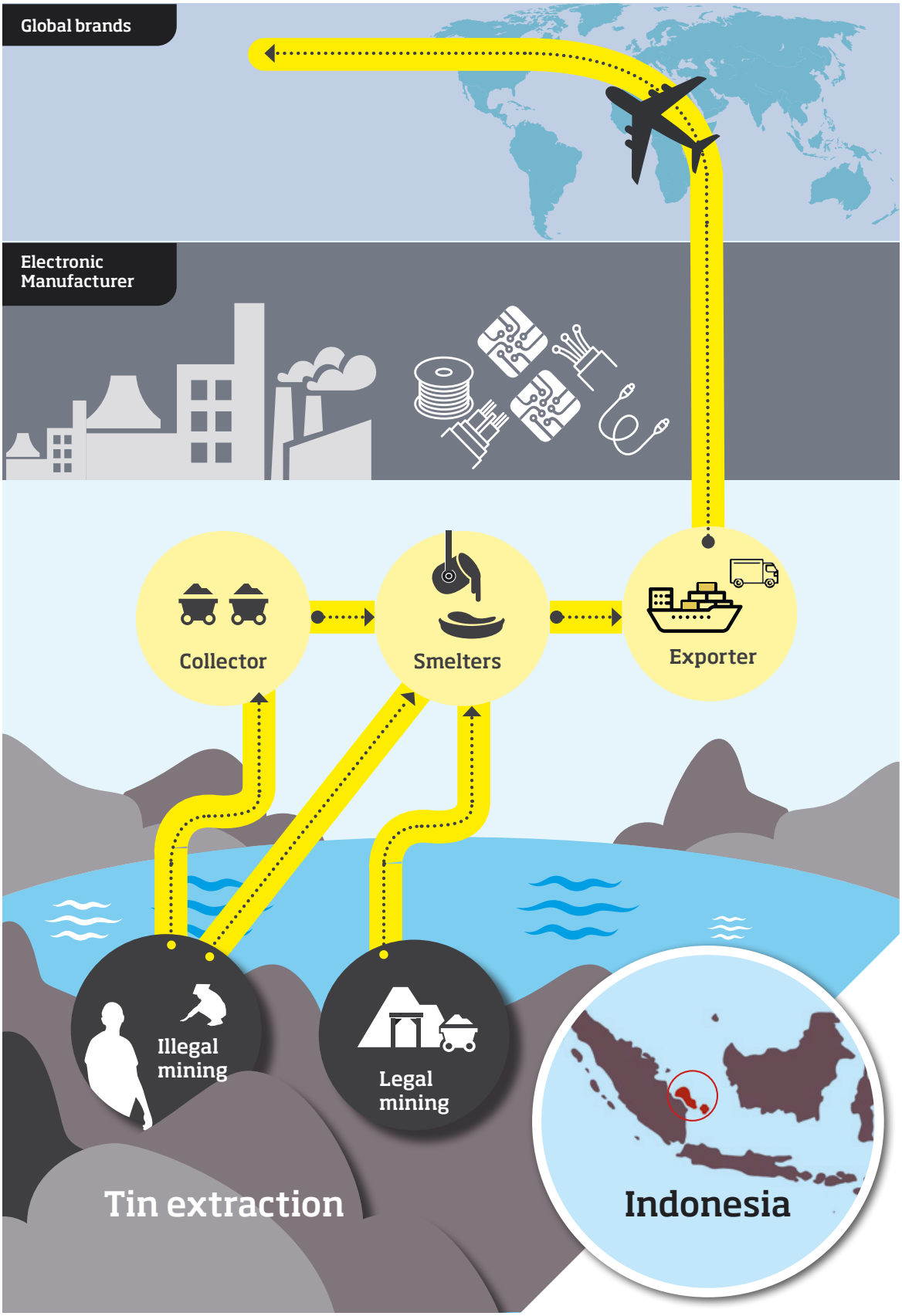

Figure 1: Simplified value chain map of tin from Bangka-Belitung, Indonesia, to global markets.

member of the international industry-group International Tin Association (ITA).[21] The ITA noted that tin mining in Bangka Belitung has been ongoing for hundreds of years and warned that the local context remained 'highly complex' due to the interplay between artisanal/small-scale mining, large-scale industrial operations, and environmental and governance risks.[22]

Criminal investigations into key companies in Indonesia's tin trade

In 2024, the Indonesian tin sector was shaken by severe corruption and illegal-mining scandals. A high profile corruption case spanning 2015–2022 revealed that illegal tin sourced from unauthorised mines in Bangka Belitung was being mixed with legally mined tin, including that of PT Timah.[23]

In early 2025, prosecutors named five private firms as suspects of colluding with former PT Timah executives to facilitate illicit mining inside licensed concessions and to falsify smelting transactions.[24] The ITA estimated that they together represented approximately half of the country's refined tin production capacity.[25] According to Swedwatch's supply chain research, the five companies suspected in the PT Timah investigation were listed in Apple's and Ericsson's smelter and refiner disclosures covering 2024.[26]

Losses from the corruption scheme have been estimated to be around USD 1.79 billion for allegedly fictitious ore sales and smelting services. The suspected illegal mining was estimated to also have caused USD 16.7 billion in environmental damage.[27] The case resulted in convictions and prison sentences for former PT Timah executives, businesspeople and public officials.[28] In August 2026, the government introduced Presidential Regulation No. 79 of 2026, intended to improve tin-mining governance in Bangka Belitung, including a requirement for PT Timah to administratively verify the legality of tin purchased from outside its licensed mining areas.[29]

In response to the investigation, the ITA called for greater transparency, robust audit mechanisms, and a shift away from relying solely on industry-certification schemes, arguing that traceability and ground-level improvements will prevent a recurrence of such practices.[30]

FACT

No significant risks identified by PT Timah

In its sustainability reports for 2024 and 2025, PT Timah repeatedly expressed its commitment to prohibiting all forms of child labour and the report reiterated that throughout 2024, the company did not identify any locations, suppliers, contractors, or other vendors posing significant risks related to child labour.[31]

Nor did PT Timah identify significant risks of other labour rights violations, such as breaches of minimum wage, overtime rules, or of any other human rights violations at any of its locations, suppliers, contractors, or other vendors.

Impacts from tin mining: Swedwatch's investigation

The findings presented in this chapter are based on site-visits, interviews and focus group discussions mainly conducted during Swedwatch's on-site research in Bangka-Belitung Islands. Participants described a wide range of interconnected impacts associated with tin mining, affecting both the environment and the social conditions of mining-affected communities. Accordingly, the section examines impacts on marine and coastal ecosystems, livelihoods and community dynamics, as well as broader human-rights concerns, including child labour and sexual abuse and cycles of exploitation, linked to the mining sector.

Ocean impacts: Blue carbon and marine biodiversity

Indonesia has one of the largest blue carbon reserves in the world, storing approximately 17 percent of global blue carbon stocks, primarily through mangrove and seagrass ecosystems. This gives Indonesia a strategic role in global climate mitigation and international carbon trading.[32]

As tin deposits have gradually become depleted on land, tin has increasingly been extracted through dredging and suction mining directly from the seabed. While onshore mining mainly destroys coastal vegetation such as mangroves, offshore mining damages seagrass meadows and marine sediment carbon stocks. Together, both weaken Bangka Belitung's blue carbon system.[33]

The coastal waters of Bangka Belitung are supported by three interconnected ecosystems: mangroves, seagrass meadows and coral reefs. Mangroves help trap sediments transported from land, while seagrass meadows filter finer particles from the water. Coral reefs, in turn, depend on these processes to maintain the clear-water conditions necessary for their survival. Together, these ecosystems provide critical spawning, nursery and feeding grounds for marine life. Disruption of any one of these ecosystems can therefore have cascading effects on marine biodiversity, fish stocks and the livelihoods of coastal communities.[34] One fisher said: *'We are defending and protecting the sea, fighting to stop mining in these waters. We don't want future generations to lose their livelihoods. If this continues, everything will be destroyed.'*[35]



Darius is one of many community members that advocate for a ban on coastal mining.

FACT

How are ocean issues human rights issues?

• **Right to a clean, healthy and sustainable environment:** The UN Human Rights Council (resolution 48/13, 2021) and the UN General Assembly (resolution 76/300, 2022) explicitly recognises that degradation of marine and coastal ecosystems undermines this right. Right to food: Fisheries and coastal ecosystems are a primary source of food and nutrition for coastal communities. Destroying fish nurseries and stocks threatens their right to adequate food. (ICESCR, art. 11)

• **Right to an adequate standard of living and to work:** Small-scale fishers, crab and shellfish gatherers and coastal farmers depend on healthy ecosystems for their income. Loss of these livelihoods undermines the right to earn a living through work they freely choose. (ICESCR, arts. 6 and 11).

• **Rights to life and health:** Mangroves, seagrass meadows and coral reefs protect coasts against storms, flooding and saltwater intrusion. Pollution from mining affects the water people use and the food they eat. Their loss threatens the rights to life and health. (ICCPR, art. 6; ICESCR, art. 12).

• **Cultural rights and the rights of Indigenous peoples:** For many coastal and Indigenous communities, the sea and coast are tied to culture, identity and traditional ways of life. Their rights to land, territories and resources are protected under international standards. (ICESCR, art. 15; UNDRIP, arts. 25–26).

• **Rights to information, participation and remedy:** Affected communities have the right to access information, to participate meaningfully in decisions about marine resources, and to effective remedy when harm occurs. For Indigenous peoples this includes free, prior and informed consent (UNDRIP, art. 32).

• **Restoration as part of the duty to remedy:** Restoring marine and coastal ecosystems helps prevent violations of multiple human rights simultaneously, aligning ecological recovery with social justice and the protection of vulnerable populations.

• **Rights of the child and future generations:** Children are especially exposed to environmental harm and will live with its long-term consequences. States must protect children's right to a clean, healthy and sustainable environment, including in the interests of future generations (CRC General Comment No. 26, 2023).



Tin dredging operations near the coast.



Coastal destruction due to tin mining.

Mangroves

Mangroves are among the most carbon-rich forests in the tropics, storing carbon in both their vegetation and organic-rich soils. On Bangka-Belitung Islands, mangrove biomass has been measured at around 225 tons per hectare, equivalent to approximately 112 tons of carbon per hectare.[36] Despite this high value, mangroves in the region have undergone severe degradation.[37] Mangrove degradation can reduce carbon storage and release previously stored carbon into the atmosphere, making their protection important for both coastal ecosystems and climate mitigation.[38]

Apart from well-researched climate linked impacts from mangrove loss, people in coastal communities across Bangka mentioned more direct effects. Speaking of changes to the mangrove ecosystem, one young man explained: *'We see how the mangroves are impacted. They act like a filter and can protect against strong weather events, and they provide habitats for lots of marine species. Where I live, the mangrove has been cleared by mining.'*[39]

Seagrass meadows

Seagrass meadows in Bangka Belitung play a critical role in carbon sequestration because most of their carbon is stored below ground.[40]

The tin mining methods consist of dredging the sea bottom. The tin found in the sand from the ocean floor stays onboard while the rest of the sand goes back into the ocean, causing turbidity that reduces photosynthesis. This reduces the sunlight that is needed for seagrass metabolism.[41] One interviewee stated: *'Baby fish grow in seagrass before they go out to deeper waters. Many people on Bangka don't understand this. We need to help people understand that seagrass is needed for fish, and that tin mining is impacting seagrass. Without seagrass there will be less fish and less food.'*[42]

Coral

Coral reefs represent the most sensitive and biologically rich marine ecosystem within Bangka Belitung's coastal waters. Functioning as critical spawning, feeding, and nursery grounds, reefs depend on clear, sediment-free water and stable seabed conditions to survive.[43] As offshore tin mining has expanded through dredging and suction mining, coral reefs have been exposed to intense physical destruction and chronic sedimentation. Coral reefs are particularly vulnerable to disturbance, and often the first ecosystem to collapse, when coastal filtering systems fail.

When tin is extracted through dredging and suction mining directly from the seabed, it strips away coral reefs, disrupts sediment layers, and creates massive underwater dust clouds known as sediment plumes. These plumes block sunlight, smother coral reefs, and disrupt the delicate balance of coastal waters.[44] The result is widespread coral bleaching, biodiversity loss, and the collapse of fish populations that many communities rely on for food and income. One interviewee stated: ***'Ocean mining has huge impacts. We used to have a rich ecosystem. Now the coral is covered [with sediments], it will never return to how it was before. There should not be any mining in the ocean.'***[45]

Impacts on land, coast and livelihoods

The expansion of tin mining in Bangka Belitung has fundamentally transformed local livelihoods, reshaping people's roles in the economy and degrading the land on which many depend for agriculture and small-scale fishing.

Land conflicts and lack of informed consent

Interviewees reported that mining permits for land and sea were often issued without prior information or consultation with affected communities, leaving residents unprepared for the potential impacts. Participants reported that licensed areas overlapped with land inhabited by Indigenous communities whose land rights were not recognised. People called for licensing decisions to be informed by assessments on the ground and consultation with communities who depend on the affected ecosystems. One interviewee noted: ***'Mining permits are issued without involvement of the communities. There is no information ahead of time. Out of the blue, the government issues licenses which then end up impacting communities.'***[46]

Expanded tin mining has transformed the region from a community of farmers and fishers into an economy increasingly dependent on extractive mining, generating economic tension between traditional farming and mining.[47] According to WALHI´s own data, 70 percent of Bangka's land is controlled by mining, timber and large-scale agricultural interests, leaving local communities with limited access. As available land shrinks, many evicted farmers and fishers have had to shift to mining as their only means of survival, having lost their traditional livelihoods and their freedom of choice.

While farming and artisanal fishing are viewed as more sustainable, mining offers the lure of 'easy money' and immediate cash flow. A miner can earn significantly more, up to 2 million Indonesian rupiah (100 EUR) per day when tin prices are high, compared to the slower, more labour-intensive returns of farming and fishing. Consequently, WALHI's statistics show a shift in the workforce: between 2000 and 2025, the agriculture sector's share of the workforce dropped from 40 percent to roughly 28 percent, while the mining sector's share surged from 10 percent to a peak of 23 percent.[48] Important to note is that WALHI estimates that most of the miners at the Bangka Belitung is still coming from other Indonesian islands.[49]

Soil degradation and agricultural failure

The physical extraction process of tin mining causes irreversible damage to the soil, often turning fertile land into 'white sand' that can no longer support cultivation. Farmers who have cultivated pepper for many years report that they are now facing harvest failures because the soil conditions cannot be restored after tin mining has taken place. Farmers also reported that they believe mining-related declines in water quality are negatively affecting their harvests. Rice farming has also been impacted, with farmers and community members reporting that the destruction of mangroves has allowed seawater to flood onto land during high tides, leading to soil salinisation. This salinity is destroying rice farms that are important for the local food system.



Siti has been a vegetable farmer her whole life. She is thankful that the water quality around her farm is still good. Many of her friends are experiencing declining harvests as a result of decreased water quality. They believe this is due to mining activities.

Interviewees highlighted the lack of post-mining environmental restoration, noting that both legal and illegal mining sites are often left without rehabilitation efforts. The lack of post-mining restoration was one of the most pressing issues for the people interviewed. In addition, land previously used for mining is reportedly often turned into palm



One of many mining sites on land in Bangka Belitung.

oil plantations, not benefiting local communities. In a similar way, aquaculture companies are using the clearance of mangroves to establish their businesses. One person explained: *'My hometown was hilly but after mining started there are only lots of pits instead. These pits are just abandoned; there is no reclamation.'*[50] Another person added:

'We don't know who built all these pits. We don't know who should be held responsible.' [51]

Moreover, interviewees often stated that the environmental degradation caused by mining has led to a harmful 'human-wildlife conflict'. As mining destroys the natural habitats of crocodiles, the animals have moved into abandoned mining pits, or need to be closer to miners in rivers.[52] Because communities are often forced to use these same pits for bathing and washing during the dry season, accidents are common causing a real threat to the communities. According to WALHI's data, around 20 people are killed or injured in crocodile attacks each year.

Mining-induced social conflict

A pervasive issue identified by local communities is the emergence of what they call 'horizontal conflict', described as a strategy where *'mining companies pit pro-mining and anti-mining individuals against each other within the same village'*.[53] This tactic erodes social cohesion, causing families and friends who once lived in harmony to ignore or oppose one another and to break down the social fabric of these villages.

One interviewee said: ***'Companies strategically divide communities to get access to their land. The companies know that when people are divided, they lose their attachment to the community, they lose the sense of place.'*** [54]

Communities also face growing social pressure due to direct competition between mining and other traditional industries like fishing and farming. As mentioned earlier, mining is reported to drive economic displacement by degrading fertile land, polluting water sources and contributing to water shortages. Pepper and rubber farmers therefore report declining yields, harvest failures and the permanent loss of arable land. In addition, tin dredging at sea destroys vital 'nursing grounds' for fish, and as a result, fishers report they must travel farther offshore to find viable fishing grounds, significantly increasing their operational costs, threatening their economic survival and eroding the local social fabric.

Substance abuse and addiction

There are indications that drug abuse has increased among the miners due to the grueling work conditions. According to the interviewees, use of methamphetamine, known locally as shabu, was described as widespread among miners, to combat fatigue and sustain long working hours. A gram reportedly costs between 15 and 25 Euro and is 'very easy to get'. Participants noted that shabu use is significantly more prevalent in mining communities than in wider society, particularly among offshore miners. One respondent said: *'The miners work almost 24 hours per day. We see shabu slowly spreading into society but it's not common there yet. Shabu use definitely started with mining.'* [55]

Beyond drug abuse, interviewees described broader social problems in the mining areas. As one participant observed: *'One of the strongest shifts in our culture is gambling, prostitution, and alcohol that is happening in mining areas.'* [56]

COMMUNITY VOICES

'It used to be beautiful here but not anymore. Now it's polluted, it's dark. The water by the beach where they don't mine is still blue, but where they mine the water is muddy. We don't swim anymore.'

'The mining licenses often overlap with community land where indigenous peoples live. They are not recognized as indigenous peoples with right to their land.'

'There are now lots of pontoons. In the past when we fished, we would catch 10-15kg fish but now we only get 3-5kg. There is a huge drop in fish population, and the taste is different. The fish tastes like petrol.'

'One day we will run out of tin. What will happen to us then?'

Child labour

In 2014, the International Labour Organization (ILO) estimated that around 6,500 children were engaged in hazardous child labour in Bangka- Belitung's tin mines.[57] Children were reported to work in dangerous and unstable pits, operate heavy machinery, and face risks such as landslides and drowning. Based on Swedwatch interviews, this pattern appears to persist, with child labour remaining a significant concern in the tin-mining sector. There are consistent reports of children present at tin-mining locations, particularly in unregistered and illegal artisanal mines.[58] Interviewees described seeing children working without basic protective equipment, such as helmets, despite the significant risks associated with mining activities, including accidents, landslides and fatalities.

'Children in the tin mines become trapped in hazardous work pathways, where there are no safety standards, no health or safety guarantees, and work locations pose health risks.' [59]

Legal mines with permits are said to have stronger regulations and certain oversight from authorities, which makes it less likely for children to be directly involved in their mining operations. However, experts noted that children can still be observed around licensed mining areas, including collecting and sifting tailings to recover leftover tin residues.[60] One female community member reported that children frequently mine along rivers after school, with some as young as five or six years old.[61]

FACT

Indonesian child labour law

As the first country in Asia, Indonesia fully ratified ILO's Worst Forms of Child Labour Convention (No. 182) in 2000, making it a binding obligation. Since 2003, Indonesia has a legal framework in place that prohibits hazardous work for anyone under 18, including in mining. The law strictly prohibits individuals under the age of 18 from working in hazardous conditions that could harm their health and safety.[62]

Addressing child labour in the mining sector has been listed as a priority area by the Indonesian government, as mining is classified as hazardous work and prohibited for children. However, the practice persists, particularly in the informal tin mining sector, due to underlying factors like poverty as well as enforcement challenges.

Drivers of child labour

A complex web of systemic issues and contextual factors drives children to mine for tin. Many families are said to be dependent on the extra income children bring. In mining families, boys in particular are commonly expected to contribute to household income from a young age, earning around EUR 1.5–5 per day, according to an expert interviewee.[63] The need for children to act as additional household breadwinners is driven by household poverty, which interviewees linked to environmental



damage caused by tin mining on Bangka. This creates a cycle of poverty: as mining undermines the income of fishing and farming families, children come under pressure to contribute by working at the mines themselves.[64]

Against this backdrop, sending school-aged children to work frequently becomes normalised out of perceived necessity. Parents who work in the mines may bring young children along, so that from an early age, mining, often in hazardous conditions, becomes a familiar way to earn money. Interviewees expressed concerns that this early exposure, whether through a parent's work or accompanying parents to the mines, increases the likelihood of children pursuing the same work, often while still in elementary school.[65]

One interviewee stated: ***'I worked in the mines for two years. There were lots of kids there, always. Nobody wears protection, no helmets or anything. There are accidents and big risks for landslides. People risk getting buried. I changed to become a firefighter (..). I feel safer working as a firefighter than a miner'.***

Children might also be drawn to mining by the prospect of earning their own money. Some use their earnings to cover school fees or save for higher education. As one focus group participant commented: *'I worked for seven years in a mine to be able to pay for university, I was 16 when I started.'* Other times earnings are used to buy

clothes, mobile phones, or motorbikes, which reinforces their decision to remain in the mines rather than in school.[66] As a focus group participant who used to work in a mine while underage outlined, making his own money and earning about 5 EUR per day, a significant amount, contributed to a sense of happiness and contentment.[67] These experiences underline the importance of a living wage so that parents can meet their children's basic needs and keep them in school. Weak oversight in artisanal mining makes it easier for children to be drawn into work. Experts have repeatedly pointed to a lack of safety standards in the informal recruitment processes, which commonly involves no age verification or other oversight mechanisms. Under these conditions, children can easily find work, and eventually may lead to a normalisation of child labour.[68]

School dropout and declining academic performance

Whether part-time or full-time, work in the mines severely disrupts children's education. According to Indonesia's Central Bureau of Statistics, Bangka Belitung's school dropout rate has been reported to exceed the national average.[69] With little educational support in mining villages, many children leave school between the ages of 13 and 16 to mine full time. Some leave as early as elementary school (ages 7 to 12), especially when they already contribute to household income.

Children who mine after school or during holidays risk falling behind academically. Exhausted from afternoon work, they often struggle to concentrate and fail to complete homework, and over time, many children leave school entirely.[70] As one student explained: *'When I went to school, lots of kids mined in the evenings, and eventually they dropped out to mine full time.'*[71]

The consequences extend beyond the individual child to the region as a whole. According to Indonesia's Central Bureau of Statistics, Bangka Belitung's Human Development Index (HDI) is below the national level.[72]

Exposure to hazards and gendered impacts

While all workers are exposed to occupational hazards, the nature and extent of that exposure can differ between boys and girls. Boys are frequently assigned heavy and hazardous labour. On land, their tasks can include digging and excavating in unstable pits, transporting soil or ore, breaking blocks, and, when trained, operating small pumps or machinery. Such work exposes boys to a range of serious risks, including landslides and collapsing pit walls, crushing injuries, cuts and wounds from sharp objects, respiratory illnesses, dehydration, heat stress and exposure to pollutants. As many mining sites are located in or near waterlogged areas, boys may also spend extended periods working in water, increasing their risk of infections, skin diseases and other health problems.

Girls, on the other hand, typically carry out support and processing tasks, such as collecting leftover tin sand from water channels, washing and sorting ore, or transporting lighter loads. These roles are often perceived as less physically demanding, yet they can still involve prolonged exposure to contaminated water, mud, and extreme heat, which can result in skin diseases, infections, and other

long-term health problems. Moreover, girls often carry a double burden, combining mining-related work with caregiving responsibilities, and heightened vulnerability to harassment and exploitation in the mine setting.

According to interviewed experts, children can also be present around sea mining operations, although their involvement is generally more indirect than in land-based mining. The core mining activities are typically carried out by adult men, who operate suction hoses and engines, dive to dredge the seabed, and separate tin-bearing material from mud. While some boys may assist with support tasks, interviewees reported that it is more common for boys and girls – estimated by one former child miner to be as young as 10 to 12 years – to visit mining pontoons to sell food or assist relatives.

Yet even if their roles are indirect, these children may be exposed to significant risks due to their proximity to heavy machinery and open water. These include drowning, strong currents, machinery-related injuries, fractures from accidents, prolonged exposure to engine noise, and contact with oil and other pollutants. These risks underscore the hazardous nature of child involvement in both land-based and offshore tin mining.

Sexual abuse and cycles of exploitation

Although rarely acknowledged openly, according to the interviewees sexual harassment and sexual abuse of children by employers and adult workers have been reported at mining sites. Girls at remote mining sites are especially vulnerable to verbal and physical harassment, sexual exploitation or asked to conduct sexual favours. It sometimes takes the form of grooming through for example offering small amounts of money, gifts, food, or favours to girls to create a sense of obligation, normalise inappropriate behaviour, or gradually coerce compliance with sexual advances. Cases often go unreported due to cultural shame, social stigma against victims, and unclear formal reporting mechanisms.[73]

The consequences of sexual harassment and abuse include psychological trauma, anxiety, depression, feelings of insecurity and social withdrawal, as well as early pregnancy and exposure to infectious diseases.[74] Girls who are affected are also highly likely to drop out of school. These harms can trap girls who are sexually exploited from adolescence in an intergenerational cycle of poverty and vulnerability. One interviewee described a 15-year-old girl who was already the mother of two children, noting that young mothers often lack the financial means to adequately support their children, increasing the risk of malnutrition. Another person added: *'The children of prostitutes become stuck in mining; the boys become miners and the girls become prostitutes. This happens again and again, into the next generation. The government knows about this problem but doesn't do anything about it.'* [75]

Several interviewees described how mining sites commonly consist of simple camps where workers rest and eat, often accompanied by a small shack or hut made of wooden planks where commercial sex is reportedly sold to miners. Two interviewees who have researched the topic, report that underage girls are commonly among

those sexually exploited at these sites. According to them, many girls are reported to have been trafficked as teenagers to Bangka Belitung from other parts of the country through false promises of employment or economic opportunities, only to become trapped in exploitative situations. As one interviewee explained, *'Women 14–20-year-old come to Bangka thinking that they will get a job in mining or agriculture but end up only getting a job as a prostitute. They can't afford to travel back home. The same thing happens at palm oil plantations but it's not as bad there as it is in tin mining. Women can get simple jobs on the palm oil farms, but prostitution is basically the only option for women in the tin mines.'*[76]

When interviewees were asked how authorities address the situation, one interviewee claimed that 'the police and military are also involved in drugs and prostitution' and therefore they believed that there was no real interest in addressing the issue.

State obligations under international human rights law

Under international human rights law, states are the primary duty bearers. Indonesia is obliged to respect, protect and fulfil the human rights of people within its jurisdiction under the treaties it has ratified. These include the International Covenant on Civil and Political Rights, the International Covenant on Economic, Social and Cultural Rights, the Convention on the Rights of the Child, ILO Conventions 138 and 182 on child labour, and the UN Protocol to Prevent, Suppress and Punish Trafficking in Persons. The UNGPs affirm that this duty includes protecting against human rights abuses by business enterprises through effective policies, legislation, regulation and adjudication, and ensuring that those affected have access to effective remedy (Guiding Principles 1 and 25). The UNGPs also call on states to take additional steps where business enterprises are owned or controlled by the state (Guiding Principle 4). This applies directly to PT Timah, which is state-controlled. In the context of this report, the state's duty covers several areas:

- ensuring that mining licences are issued only after affected communities have been informed and meaningfully consulted, and respecting the land rights of Indigenous peoples
- enforcing post-mining reclamation and protecting coastal and marine ecosystems on which communities depend
- preventing child labour through effective labour inspection, including in the informal sector
- investigating and prosecuting the trafficking and sexual exploitation of children
- addressing illegal mining and the corruption that enables it

The recognition of the right to a clean, healthy and sustainable environment by the UN Human Rights Council (2021) and General Assembly (2022) further underlines states' obligation to prevent environmental harm that undermines human rights.

States where multinational companies are headquartered also have a role: the UNGPs expect them to make clear that companies domiciled in their territory must respect human rights throughout their operations and value chains (Guiding Principle 2). Mandatory due diligence legislation, such as the EU Conflict Minerals Regulation and the Corporate Sustainability Due Diligence Directive, is one way of meeting that expectation.

Corporate responsibility under international normative standards

As stated above, under international human rights law, states are the primary duty bearers. Companies, however, have an independent responsibility to respect human rights and protect the environment throughout their value chains, regardless of whether states fulfil their own obligations. In light of the risks and adverse impacts identified in this study, this responsibility applies to companies of all sizes. It is particularly important in high-risk sectors and contexts, such as Indonesia's extractive industry, and is set out in international frameworks and guidelines outlined below.

Under the UNGPs, all business enterprises have the responsibility to respect human rights throughout their value chains, including companies sourcing tin.[77] The UNGPs hold that business enterprises must prevent, mitigate and, where appropriate, remedy human rights abuses that they cause or contribute to. Businesses must seek to prevent or mitigate any adverse impacts related to their operations, even if these impacts have been carried out by suppliers. To this end, businesses have the responsibility to undertake ongoing human rights due diligence and have processes in place to enable remediation for any adverse human rights impacts they cause or contribute to.[78] Furthermore, the UN provides guidance to businesses on integrating a gender perspective in implementing the UNGPs. For example, this gender guidance holds that business enterprises should always regard sexual harassment and gender-based violence as risks of severe human rights impacts, and should have zero tolerance for such impacts throughout their operations (GP 17).[79] In a further example, the guidance holds that in prioritising action to address those adverse human rights impacts that are most severe, business actors should recognise that gender discrimination, sexual harassment and gender-based violence have severe and irremediable impacts (GP24).

The OECD Guidelines for Multinational Enterprises on Responsible Business Conduct set out these expectations across sectors,[80] while the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas gives mineral-specific recommendations through a five-step framework as part of the Supplement on Tin, Tantalum and Tungsten.[81] While specific due diligence requirements and processes will differ depending on the mineral and the position of the company in the supply chain (detailed in the Supplement), companies should review their choice of suppliers and sourcing decisions and integrate into their management systems the OECD's five-step



Land-based mining at one of the water-filled pits.

framework. Recommended actions vary depending on whether the company is located upstream or downstream of the value chain. 'Upstream' includes actors from the mine to the smelter or refinery level. 'Downstream' refers to retailers, including component and product manufacturers and original equipment manufacturers.[82]

The Supplement recommends, among other things, that these companies establish a system of internal control over the minerals in their possession (chain of custody or traceability) and establish on-the-ground assessment teams, which may be set up jointly through cooperation among upstream companies while retaining individual responsibility, for generating and sharing verifiable, reliable, up-to-date information on the qualitative circumstances of mineral extraction, trade, handling and export from conflict-affected and high-risk areas. This Guidance calls on these upstream companies to provide the results of risk assessments to their downstream purchasers and have the smelters/refiners' due diligence practices audited by independent third parties, including through an institutionalised mechanism.[83] Together, the steps move companies from internal governance through risk assessment to external verification and transparency.[84]

In addition, the OECD Due Diligence Guidance for Meaningful Stakeholder Engagement in the Extractive Sector emphasises that properly conducting meaningful stakeholder engagement is particularly important in the extractive sector, which is associated with large, resource-seeking financial and infrastructure investments, immobile production, a long project lifecycle and extensive social, economic and environmental impacts.[85] The Guidance states that 'multinational



The workers are paid daily based on the amount of tin they extract. The earnings are shared between the three miners working together.

enterprises should engage with relevant stakeholders in order to provide meaningful opportunities for their views to be taken into account in relation to planning and decision making for projects or other activities that may significantly impact local communities', thus providing a due diligence framework for enterprises operating in the extractive sector to identify and manage risks with regard to stakeholder engagement activities to ensure they play a role in avoiding and addressing adverse impacts as defined in the OECD Guidelines.[86]

The Children's Rights and Business Principles, developed by Unicef, the UN Global Compact and Save the Children[87] are the first comprehensive set of principles to guide business actors on the full range of actions to respect and support children's rights. Under the principles, respecting children's rights as outlined by the Convention on the Rights of the Child, and ILO Conventions 138 (on Minimum Age) and 182 (on Worst Forms of Child Labour) is the minimum required of business. Moreover, the principles recommend business actors to contribute to the elimination of child labour, including in all business activities and business relationships, to ensure the protection and safety of children in all business activities and facilities and to provide decent work for young workers, parents, and caregivers.

Resolutions from the UN Human Rights Council in 2021 (A/HRC/RES/48/13) and the UN General Assembly in 2022 (A/RES/76/300) added the right to a clean, healthy, and sustainable environment to the library of internationally recognised rights. Responsibilities of business actors outlined therein are comprehensive and include both procedural and substantive responsibilities. Business actors must identify and assess risks and prevent or mitigate environmental harm of their activities by enacting, implementing and enforcing environmental and human rights impact assessments and due diligence. They are further recommended to remediate and redress harm and injustice of their business activities. Moreover, business actors must provide access to information to affected individuals and communities and engage in community consultation and transparent decision-making.

Company responses

As part of this research, Swedwatch contacted four companies identified through their public records such as Conflict Minerals Reporting Template (CMRT) disclosures as sourcing tin linked to smelters and refiners on Bangka Island: Apple, Ericsson, Tesla and Volkswagen Group (See Figure 2). Each company received a set of questions grounded in the UNGPs and the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, covering sourcing volumes, supply-chain traceability, risk identification, mitigation practices and grievance mechanisms. Companies were contacted in May 2026 and given three weeks to respond, with a deadline in June 2026 and the option to request an extension. They were informed that their response, or the absence of one, would be reflected in this report. The final version of the report was also shared with the four companies before publication, and they were offered the opportunity to publish a comment on the report's findings on Swedwatch's website.



Figure 2: Company responses to Swedwatch's questions.

Apple

Apple's Smelter and Refiner List covering 2024 included facilities that Swedwatch identified as located in the Bangka Belitung Islands.[88] Despite three follow-up emails between May and July 2026, Apple did not provide substantive answers to Swedwatch's questions. In response to the last follow up emails, Apple's Environment and Supply Chain Innovation team confirmed that it wished to review the report before publication. Apple is noted in this report as having been given the opportunity to respond but not having done so.

Ericsson

Ericsson's Conflict Minerals Report covering 2024 listed smelters/refiners that Swedwatch identified as located in the Bangka Belitung Islands.[89] The Responsible Sourcing Unit at Ericsson provided a detailed written response in July 2026. Below is a summary of the response made by Swedwatch. The full response is available on Swedwatch's website. Ericsson stated that it does not purchase tin directly and has no direct purchasing relationships with tin mines, smelters or refiners. Tin enters its supply chain indirectly through solder and components across multiple supplier tiers, which limits its ability to trace tin to mine level. Ericsson said its due diligence is informed by the OECD Due Diligence Guidance and its Code of Conduct for Business Partners, and that it identifies and risk-assesses smelters and refiners potentially connected to its supply chain using supplier-reported data, Responsible Minerals Initiative (RMI) information, and civil society and media reporting. The company said it was reviewing the findings shared by Swedwatch through its conflict and critical minerals due diligence process, and that it would take, where credible evidence linked a smelter or supplier in Ericsson's supply chain to serious human rights or environmental harm, appropriate action, including engagement with direct suppliers and industry initiatives (e.g. the RMI), and, where necessary, further steps including potential removal from its supply chain as a last resort. Ericsson also pointed to its participation in RMI-led engagement and capacity-building with important Indonesian tin smelters and relevant stakeholders, focused on responsible sourcing expectations and stronger upstream due diligence controls, intended to improve understanding of downstream expectations, encouraging stronger smelter and refiner management systems, and contributing to practical improvements in how high-risk sourcing contexts are identified and managed. Ericsson also confirmed that external stakeholders including suppliers, business partners and other parties who wish to raise concerns can raise concerns anonymously through the Ericsson Compliance Line or the RMI's own grievance mechanism.

Tesla

Tesla's published 3TG smelter/refiner list included facilities that Swedwatch identified as located in the Bangka Belitung Islands.[90] Despite three follow-up emails between May and July 2026, Tesla did not respond to Swedwatch's emails or questions. Tesla is noted in this report as having been given the opportunity to respond but not having done so.

Volkswagen Group

Volkswagen Group's Responsible Raw Materials Report covering 2024 listed smelters/refiners that Swedwatch identified as located in the Bangka Belitung Islands.[91] Following an initial follow-up email, Volkswagen Group informed Swedwatch by phone that it did not have the capacity to engage with the questions as part of this research. After the phone call, Swedwatch followed up with an email stating that its response would be reflected in the report.



Fishers bring a boat ashore in Batu Beriga, a village on Bangka Island. The waters off the village remain largely untouched by tin mining, thanks to local protests.

Conclusion

Tin is a critical mineral underpinning both the digital economy and the green transition, but meeting demand must not come at the expense of human rights and the environment. This report documents serious harm on land and at sea in the Bangka Belitung Islands, which supply around one fifth of the world's tin. The persistence and severity of these impacts demand urgent action and accountability from the Indonesian state, companies and financial investors linked to this value chain.

Swedwatch's findings reinforce longstanding concerns about the harmful impacts of tin mining. On land, thousands of unreclaimed pits, degraded soils and salinised rice fields have eroded farming livelihoods. At sea, dredging has destroyed coral reefs, seagrass meadows and mangroves, weakening an important blue carbon system and depleting fish stocks. As traditional livelihoods collapse, more people, including children, are drawn into mining. Child labour persists, particularly in informal mines, contributing to school dropout rates and exposing children to hazardous work. Girls and women face sexual harassment and exploitation, including trafficking. Mining permits are frequently issued without informing or consulting communities, and conflict over land and resources is undermining social cohesion. Illegal mining is reported to be widespread.

Tin from Bangka Belitung is linked to the supply chains of global companies, including the contacted companies Apple, Ericsson, Tesla and Volkswagen Group, through their public smelter and refiner lists. Of these four companies, only Ericsson provided answers to Swedwatch's questions. Its response described due diligence measures in place but also acknowledged its limitations in tracing tin to mine level. The report findings underline the need for companies to assess whether their due diligence processes effectively identify and address risks in mining-affected communities.

The report's title asks for whom tin is critical. For the global economy, it is critical as a material. For the communities of Bangka Belitung, it has been critical in a different sense: their land, sea and futures have been reshaped by its extraction. Addressing this requires companies to conduct human rights and environmental due diligence informed by the lived experience of affected communities, work towards genuine traceability, and support effective ecosystem restoration. Investors should use their leverage to encourage and monitor these efforts. Meaningful participation by affected communities, with particular attention to women and children, is essential to protect livelihoods and ensure that the green transition respects human rights.



Water-filled pits
left by mining.

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