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# How Indonesia's ban on raw nickel exports provides lessons for fiscal and economic policy in the low-carbon transition

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# Contents

# Summary

Indonesia is abundant in the transition-critical mineral nickel. In 2020 the government banned exports of raw nickel to capitalise on its value at home and in global supply chains as it transitions to a low-carbon, climate-resilient economy. But the country also faces environmental and social trade-offs in the exploitation of this mineral. Lessons can be drawn from the Indonesian example in other countries facing similar resource and sustainable growth dilemmas.

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**Nickel is critical to the global energy transition due to its use in technologies such as batteries, wind turbines and solar panels.** Indonesia is pursuing a national strategic project that draws on its vast nickel resources to strengthen domestic industry and capture greater value from global supply chains. In 2020, the Indonesian government accelerated the strategy by reinstating a ban on exports of nickel ore. This catalysed investment in smelter and processing capacity and pushed Indonesia's policy objectives towards deeper integration into supply chains for electric vehicle (EV) batteries.

**Economic policy and climate policy are deeply interconnected in Indonesia, as they are in many emerging markets and developing economies (EMDEs).** Like other EMDEs, Indonesia is experiencing rapid economic growth while simultaneously confronting climate risks. The country faces a major policy challenge in how to sustain growth following a commodity boom while remaining on a sustainable development pathway.

**In its policy of restricting mineral exports, the Indonesian government's mission evolved from increasing the value of these exports to achieving greater integration into the EV supply chain.** The export ban attracted rapid investment in nickel smelters. This resulted in nickel production that has exceeded 50% of the global total since 2023, solidifying Indonesia's dominant position in the nickel mining industry. The Indonesian government complemented the ban on exports of raw nickel with fiscal incentives and regulatory reforms to help draw in investment. It did so from a position of macroeconomic strength.

**Much of the increased funding for Indonesia's nickel smelters has come from foreign direct investment (FDI).** This has enabled the development of the Indonesia Morowali Industrial Park (IMIP) in Central Sulawesi and the Indonesia Weda Bay Industrial Park (IWIP) in North Maluku, which serve as hubs for the industrialisation of Indonesia's nickel sector. The focus of the country's nickel production has shifted from lower-priced ore and concentrates to more valuable ferronickel and alloy. Indonesia's downstream integration into the nickel supply chain continues to advance with its export of nickel sulphates, which are often used in EV batteries. Partly due to the increase in the value of its exports, the country has maintained a trade surplus since May 2020.

**Yet Indonesia faces challenges in the nickel market linked to oligopsony, price fluctuations, global competition, investment dynamics and a public backlash centred on environmental and biodiversity concerns.** Domestically, while the export ban has allowed Indonesia to move along the nickel supply chain, it has also effectively created an oligopsony in which Chinese-Indonesian smelting consortia can dictate the market price and reduce the profit margins of mining companies in the country. With nickel prices having fallen sharply due to oversupply, Indonesia's policy on the nickel industry faces growing risks. Shifting market dynamics and slowing demand for EVs have led to a decline in investment in Indonesia. Meanwhile, the recent development of new mining areas, especially in Raja Ampat, has heightened public concern about the industry's impact on regions rich in marine biodiversity.

**The raw-nickel export ban has had a positive impact on several important economic indicators.** These include the export performance of nickel products, GDP growth, government revenue and employment opportunities. Major nickel-producing regions have experienced faster GDP growth than the national average. During booms, the increase in revenue collection in these regions has often

outstripped the national rate, and they have gained from increased labour demand in mining and related activities, together with improvements in job quality and wages. However, these areas still make a relatively small contribution to national GDP and revenues, reflecting Indonesia's persistent regional disparities.

**State-led intervention in Indonesia's nickel industry has had unintended costs, and has involved economic, environmental and social trade-offs.** The economic costs of this intervention include risks associated with the resource curse, market distortions and inefficiencies linked to policy-driven, capital-intensive investment in downstreaming, as well as the longer-term vulnerability created by the depletion of finite resources. Growth in nickel mining has also accelerated environmental degradation and disrupted communities, contributing to a rise in agrarian conflict. These trends point to an important weakness of resource-led strategies: short-term gains can temporarily mask long-term risks if the economy becomes overly dependent on a single commodity, production hub or trade partner.

## Priorities for Indonesia and other countries

**The key policy challenge is not only to maintain growth during a boom, but to convert commodity-driven momentum into a durable and sustainable development pathway.** Indonesia's experience in banning raw nickel exports holds important lessons for state intervention and the design of economic policy in countries that have a wealth of natural resources. Export restrictions can create space for industrial development and fiscal gains, but these benefits need to be balanced with strong governance, credible environmental safeguards and careful planning for adverse shocks. This underscores an important lesson for policymakers: different minerals, different places and different institutional contexts require different approaches.

Priority areas for further policy discussion and research include:

- Revenue management during resource booms. The ways in which windfall revenues are saved, invested and redistributed should support long-term productivity and resilience.
- Industrial policy design and state intervention. There needs to be an appropriate balance between market signals and state direction in production, exports and downstream integration.
- Environmental safeguards and decarbonisation of the value chain. There is a demand for cleaner energy sources for minerals processing, more effective waste management, land rehabilitation, and clearer environmental standards for mining operations.
- Labour and community outcomes. Worker mobility, local hiring, training and the management of foreign labour are important mechanisms to strengthen community participation and share the benefits of industrial development more widely.
- Development beyond GDP. Downstream industrial development should align with broader investment in human capital and capability, initiatives to empower local communities and reduce inequality, and efforts to achieve environmental sustainability goals.

# 1. Introduction

This report provides insights into the impact of Indonesia's nickel export ban on economic development, fiscal planning, environmental sustainability and social cohesion. The Introduction explains the context and workings of the ban, before the main part of the report turns to its implications across a wide range of policy areas.

Indonesia is home to the world's largest reserves of nickel. This mineral is critical to the global energy transition due to its use in electric vehicle (EV) batteries and other renewable energy technologies, such as wind turbines and solar panels (Shannak et al., 2024). The country initially banned exports of raw nickel in 2014 as part of an effort to increase the value of its mineral exports. By 2020, Indonesia had shifted towards a policy focused on greater integration into international EV supply chains. With the export ban leading to rapid investment in nickel smelters, Indonesia has accounted for more than half of global nickel production since 2023.

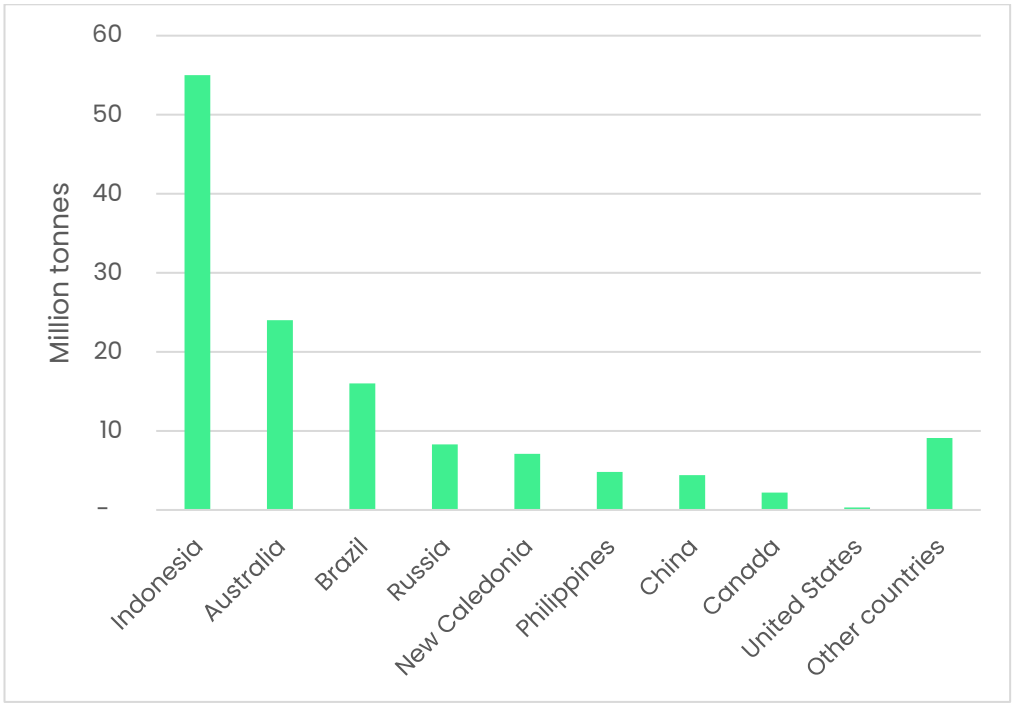
The Indonesian government complemented the export ban with fiscal incentives and regulatory reforms designed to draw in investment. It did so from a position of macroeconomic strength. Yet while many countries have increased the use of export restrictions on raw materials in recent years, the results of these policies have varied across contexts and types of minerals.

The report provides insights into the evolution of the export ban and the trade-offs involved, identifying lessons on the state's role in industrial development for policymakers in Indonesia and other countries similarly richly endowed with natural resources.

## Nickel reserves and production

As shown in Figure 1.1 below, Indonesia's 55 million tonnes of nickel reserves account for more than 40% of global reserves (US Geological Survey, 2025).

**Figure 1.1. Global nickel reserves**




*Source: US Geological Survey (2025).*

Indonesia's nickel reserves are concentrated in the rural areas of Sulawesi Island (Central Sulawesi and South Sulawesi), the North Maluku islands and Papua (see Figure 1.2 below). Located far from Indonesia's economic centre, Java, these areas have historically experienced limited infrastructure and economic development. This poses challenges for efforts to rapidly develop mining concerns and energy resources in these areas.

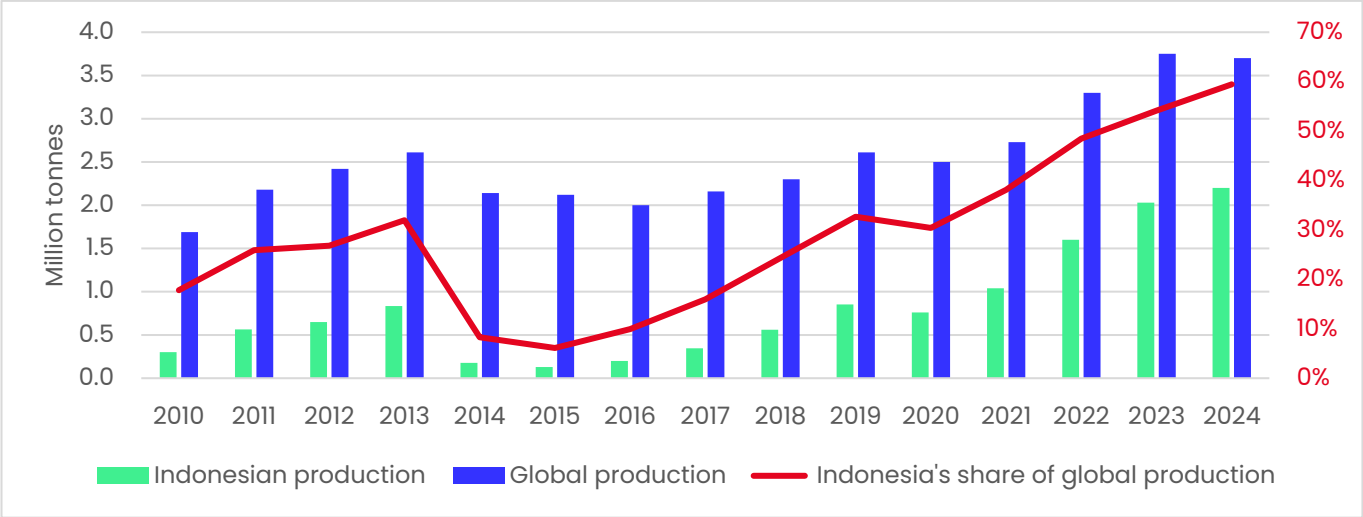
**Figure 1.2. Location of nickel reserves in Indonesia**

*Sources: Authors; Unsplash.*

Large-scale commercial nickel production began in Indonesia in the 1970s with the mining of ore. The industry can be traced back to the 1900s (before independence), when a Dutch geologist and mineral expert discovered nickel in Pomalaa, Kolaka Regency, in Southeast Sulawesi (Haeruddin et al., 2024). The country's oldest nickel mining company is PT Vale Indonesia, which began exploration in the 1920s (PT Vale, 2026). PT Vale initially focused on upstream operations (extraction), exporting most of the ore it produced to countries such as China, South Korea and Japan, where this was processed into steel (Warburton, 2024). State-owned company PT Pertambangan Nikel Indonesia began nickel-mining operations in the 1960s (Haeruddin et al., 2024). It merged with several government mining projects to form PT Aneka Tambang (PT Antam) and started the commercial operation of a ferronickel plant in Southeast Sulawesi in 1976 (PT Antam, 2026a).

Between 1996 and 2006, Indonesia's nickel production remained largely stable at 5-10 million tonnes per year. Thereafter, China's industrial expansion and growing stainless steel and nickel pig iron (NPI) industry led to an increase in demand (Terauds, 2017). Indonesia began to draw more heavily on its nickel laterite ore reserves, averaging around 25% of global nickel production during 2010–13. However, production dropped significantly between 2014 and 2016 after the government banned the export of nickel ore, a policy it implemented via the Regulation of the Minister of Energy and Mineral Resources No. 1 of 2014. Under this regulation, mineral products needed to be processed and refined domestically, with the intention of industrialising the sector and increasing the value of Indonesian exports (Ministry of Energy and Natural Resources, 2014). The impact of the ban is shown in Figure 1.3 below, with Indonesia's share of global nickel production declining from 32% in 2013 to roughly 8.3% in 2015.

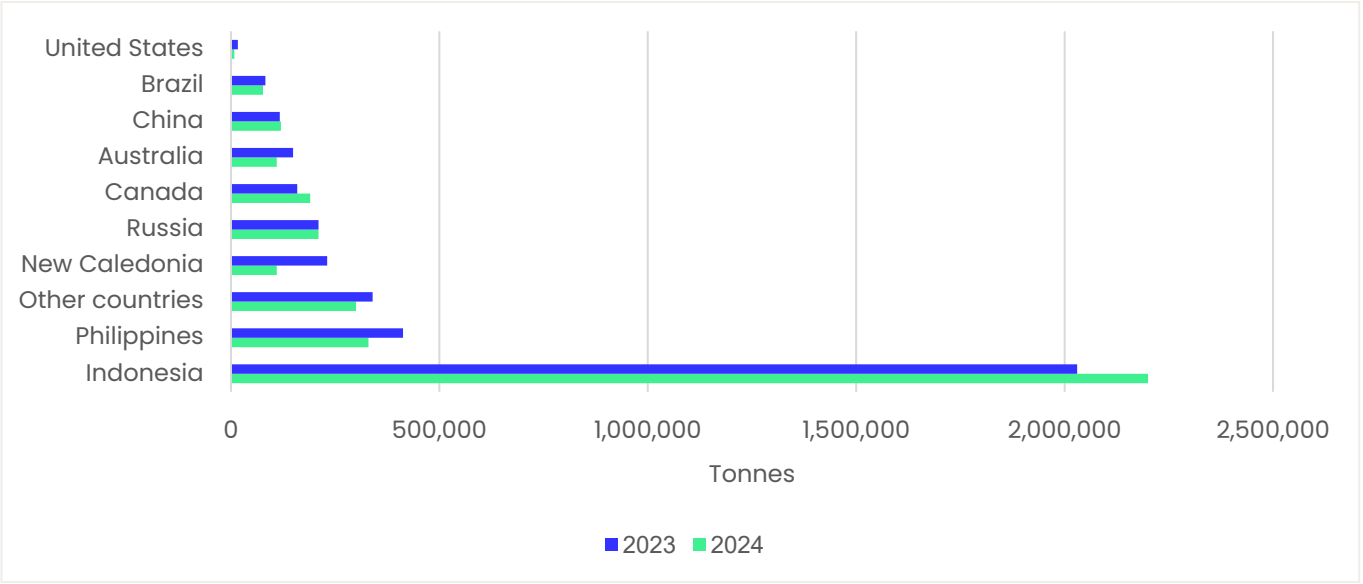
**Figure 1.3. Indonesia's nickel production as a share of global total, 2010–24**




*Sources: Authors' analysis of USGS Mineral Commodity Summaries, 2014–25.*

After the slowdown of nickel mining production between 2014 and 2016, Indonesia temporarily lifted the export ban in 2017 (Global Trade Alert [GTA], 2017). Thereafter, the ban attracted rapid investment in domestic nickel smelters, which grew from only two in operation in 2014 to 59 by 2025 (Medina, 2025; Schreier et al., 2025). Production capacity also shifted from nickel ore and concentrates to the more valuable ferronickel and alloy.

**Figure 1.4. Nickel mine production by country, 2023-24**




*Source: Authors' analysis of USGS (2025).*

Indonesia's production of 2 million tonnes in 2023 and 2.2 million tonnes in 2024 solidified its position as the dominant force in global nickel mining (see Figure 1.4 above). By comparison, global production was 3.75 million tonnes and 3.7 million tonnes in these years, respectively.

## How the export ban works

As the Organisation for Economic Co-operation and Development (OECD) reports, countries' use of export restrictions on industrial raw materials increased significantly between 2009 and 2023 amid

growing market and policy tensions (OECD, 2025). Indonesia is one of 53 countries that imposed a ban on mineral exports in this period (Kowalski and Legendre, 2023).

**Table 1.1. Indonesia's nickel export restrictions, 2009–20**

| Year | Government policy |
|---|---|
| 2009 | • The Indonesian government introduced Law No. 4 (2009) on Mineral and Coal Mining, specifying that mining companies must begin adding value to their mineral production beyond ore processing within five years of the law's enactment.<br>• While Indonesia's economy had long been reliant on raw commodity exports, policymakers recognised that that the country's mineral resources were finite. The commodity boom boosted government revenues, but cheap exports had insufficient impact on national and regional economic development. The law was an attempt to boost the long-term health of the economy by controlling more valuable areas of minerals production and attracting investment in industrial development. |
| 2014 | • The government introduced regulation Peraturan Pemerintah No. 1 (2014) to implement Law No. 4 (2009), targeting mineral concession holders in a bid to build domestic refining capacity.<br>• In support of that regulation, the Minister of Energy and Mineral Resources introduced regulation Peraturan Menteri No. 1 (2014), specifying that the export ban would come into effect on 12 January 2014. |
| 2017 | • On 11 January, the government relaxed its policy through regulation Peraturan Pemerintah No. 1 (2017), which stated that certain types of ore with a nickel concentration of less than 1.7% could be exported during the five-year transition to a full ban. |
| 2019 | • On 2 September, the government published a press release expressing a stronger commitment to a full ban on exports of raw nickel, stating that this would come into effect in 2020 – two years ahead of the initial plan.<br>• The government reasoned that, with 11 nickel smelters already in operation and 25 more under development, Indonesia had established a reliable capacity to process all the nickel ore it produced.<br>• The government also issued Presidential Decree No. 55 (2019) on the Battery Electric Vehicle Acceleration Programme for Road Transportation, along with Ministry of Energy and Mineral Resource Regulation No. 11 (2019) on the ban on exports of raw nickel to support domestic industry. |
| 2020 | • Indonesia fully implemented the ban on raw nickel exports on 1 January.<br>• Parliament enacted Law No. 3 (2020), amending Law No. 4 (2009), on minerals and coal. This signalled a stronger commitment to increase downstream minerals processing and manufacturing in Indonesia. |

*Sources: Indonesian Ministry of Energy and Mineral Resources; Global Trade Alert (2017); International Energy Agency (2023); authors.*

## Complementary measures

The Indonesian government complemented the nickel export ban with several other measures. First, the government passed the 2020 Omnibus Law on Job Creation, which simplified bureaucratic processes and accelerated investment by participating companies. Second, it introduced fiscal incentives for its strategic project, including a tax allowance, exemptions from import duties, and a tax holiday that exempted firms in the nickel industry from corporate tax for five to 20 years (Warburton, 2024).

The position of macroeconomic strength that allowed Indonesia to make these reforms is reflected in its 2025 Article IV consultation with the International Monetary Fund (IMF). The consultation highlights Indonesia's economic resilience, noting that the country has achieved robust growth and kept inflation comfortably within the target range despite facing a challenging external environment. The IMF emphasises Indonesia's track record of prudent macroeconomic policymaking as having stood out among its peers for more than 25 years.

Indonesia implemented its export restriction policies under Law No. 3 (2020), which covers industrial raw materials such as nickel, bauxite and several other minerals (see Table 1.1 above). The law has had mixed results for workers: districts with prominent nickel industries have experienced a sustained rise in employment, while those with prominent bauxite industries have faced job losses (Bosker et al., 2025).

Like a similar ban in the Democratic Republic of the Congo (on cobalt exports), Indonesia's ban resulted in a significant reduction in exports of unprocessed minerals and an increase in investment in domestic downstream capacity, leading to greater downstream production (Andrenelli et al., 2025). Such effects have tended to be concentrated in the stage of production immediately after the processing of raw minerals, mainly involving Chinese firms that control these segments of the value chain (ibid.). These are only some of the trade-offs governments can face when building a sustainable industrial policy focused on minerals that are critical to the net zero transition.

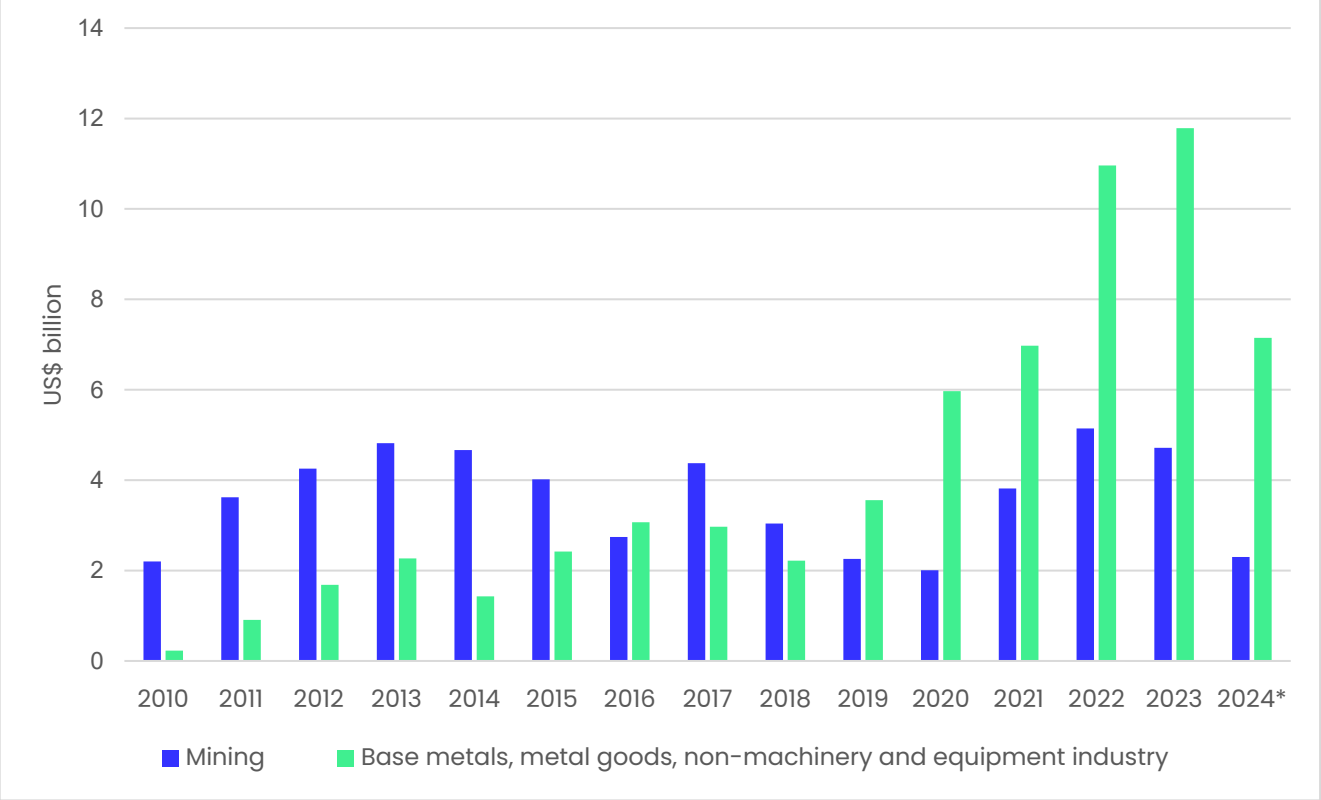
# 2. Overview of nickel mining in Indonesia

Indonesia's nickel resources have attracted large-scale investment in smelters and the EV industry. The country's ban on exports of nickel ore has resulted in a shift in production towards higher-priced ferronickel and alloy. Indonesia's downstream integration into the nickel supply chain has continued to advance since 2023 with the export of nickel sulphates. Yet the country faces challenges in the nickel market linked to oligopsony, price fluctuations, global competition, investment dynamics, and a public backlash related to environmental and biodiversity concerns, as discussed in this section.

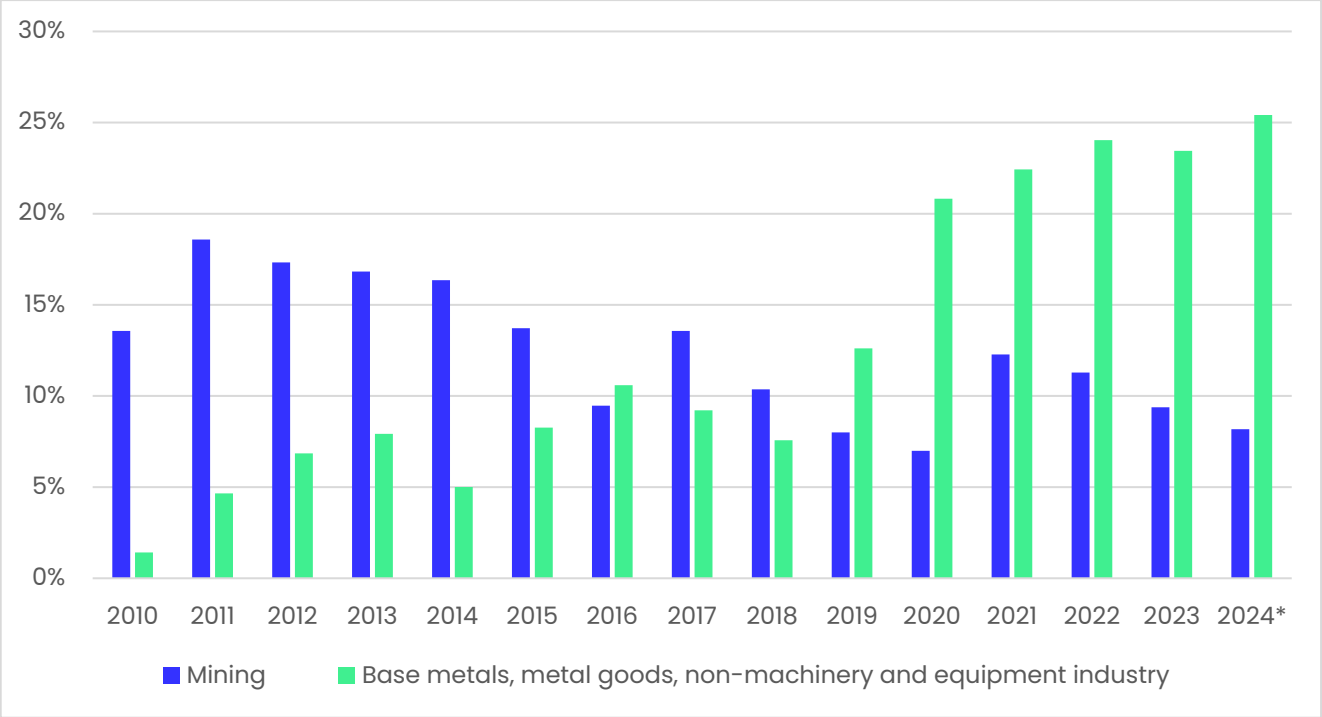
## Investment in nickel mining

In 2024 and 2025, nickel mining accounted for roughly 9% of investment in Indonesia's downstreaming sector (Ministry of Investment and Downstream Industry, 2025; 2026). In contrast, the EV ecosystem accounted for just 0.1% of such investment in 2024 (Ministry of Investment and Downstream Industry, 2025). Figure 2.1 below shows foreign direct investment (FDI) in the mining and base metals (nickel and other minerals) sectors from 2010 to 2024.

**Figure 2.1.**
**FDI in mining and base metals, 2010-24**



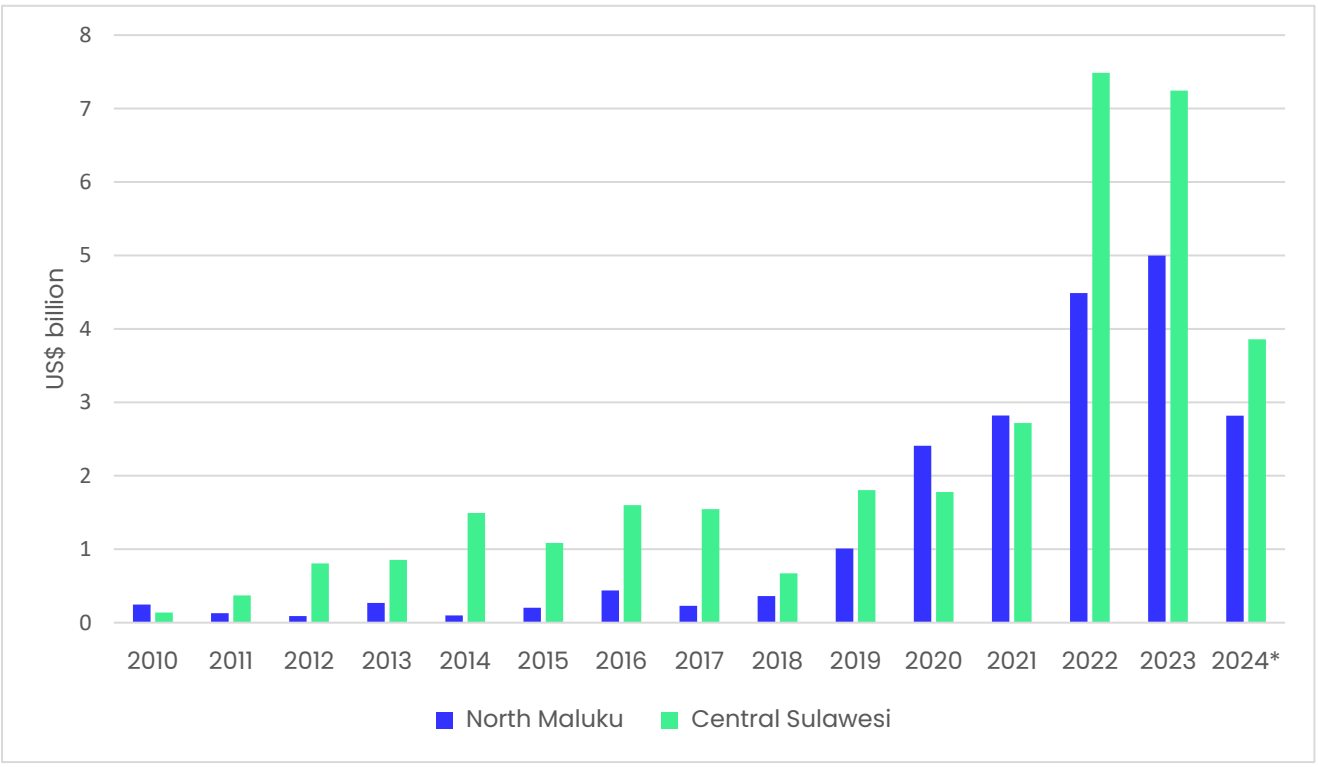
**Mining and base metals as a share of total FDI, 2010–24**



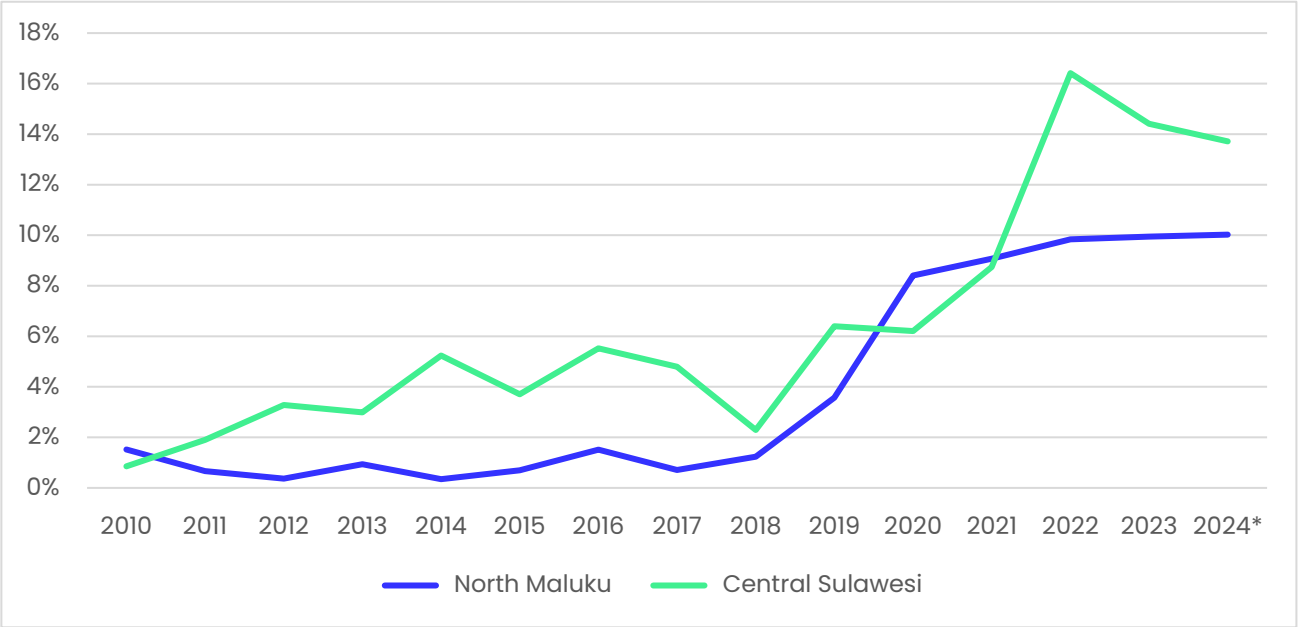

**Note: 2024 statistics are for the first half of the year. Source: Ministry of Investment and Downstream Industry (2024b).*

Central Sulawesi's and North Maluku's share of Indonesian FDI rose from less than 5% each in 2014 to more than 15% and 10%, respectively, by 2023 (see Figure 2.2 below). According to the IMF, Indonesia has performed well in attracting FDI since 2020, despite the challenges posed by the COVID-19 pandemic (IMF, 2023). The 47% rise in FDI Indonesia experienced in 2022 was led by sectors related to downstream nickel production, with investors based in China and Hong Kong accounting for almost half the increase.

**Figure 2.2.**
**FDI in North Maluku and Central Sulawesi, 2010–24**



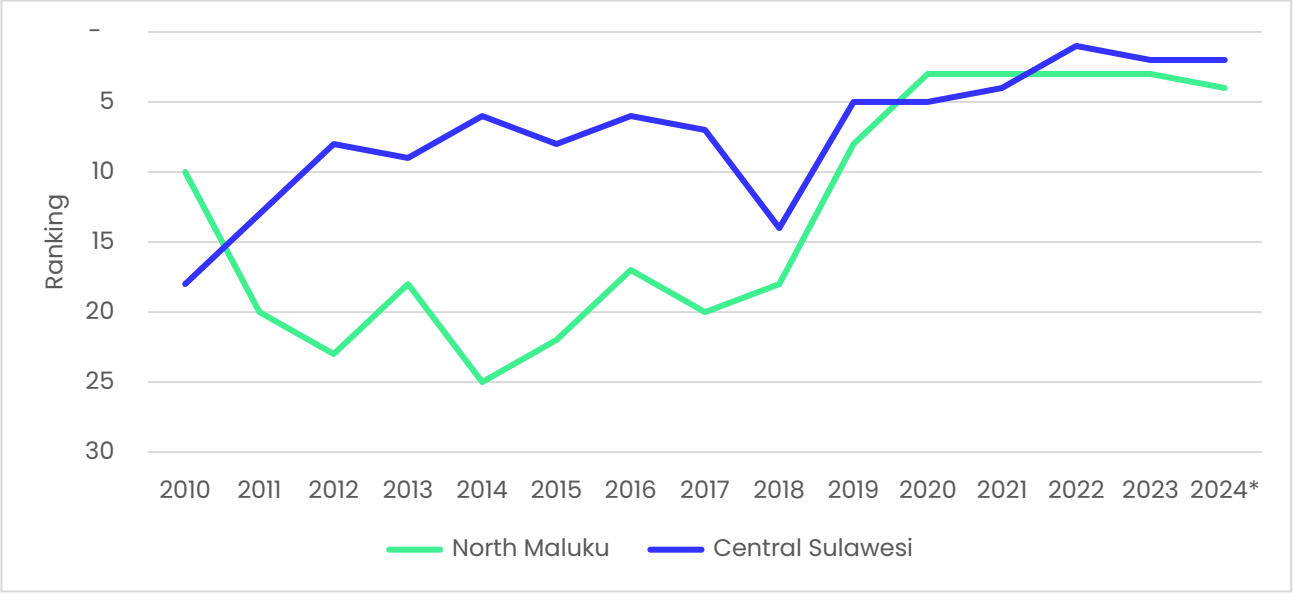
**FDI in North Maluku and Central Sulawesi as a share of total FDI, 2010–24**




**Note: 2024 statistics are for the first half of the year. Source: Ministry of Investment and Downstream Industry (2024a).*

**Investment in nickel mining enabled the development of the Indonesia Morowali Industrial Park (IMIP) in Central Sulawesi and the Indonesia Weda Bay Industrial Park (IWIP) in North Maluku**. These sites are the main hubs for the industrialisation of Indonesia's nickel sector. Central Sulawesi hosts 35 smelters, with 22 in IMIP, and North Maluku hosts 32, with 19 in IWIP (Schreier et al., 2025). As a result, between 2020 and 2024, North Maluku and Central Sulawesi were among the top five provinces for FDI in Indonesia (see Figure 2.3. below).

**Figure 2.3. Provinces' ranking as a destination for FDI, 2010–24**




**Note: 2024 statistics are for the first half of the year. Sources: Ministry of Investment and Downstream Industry (2024a).*

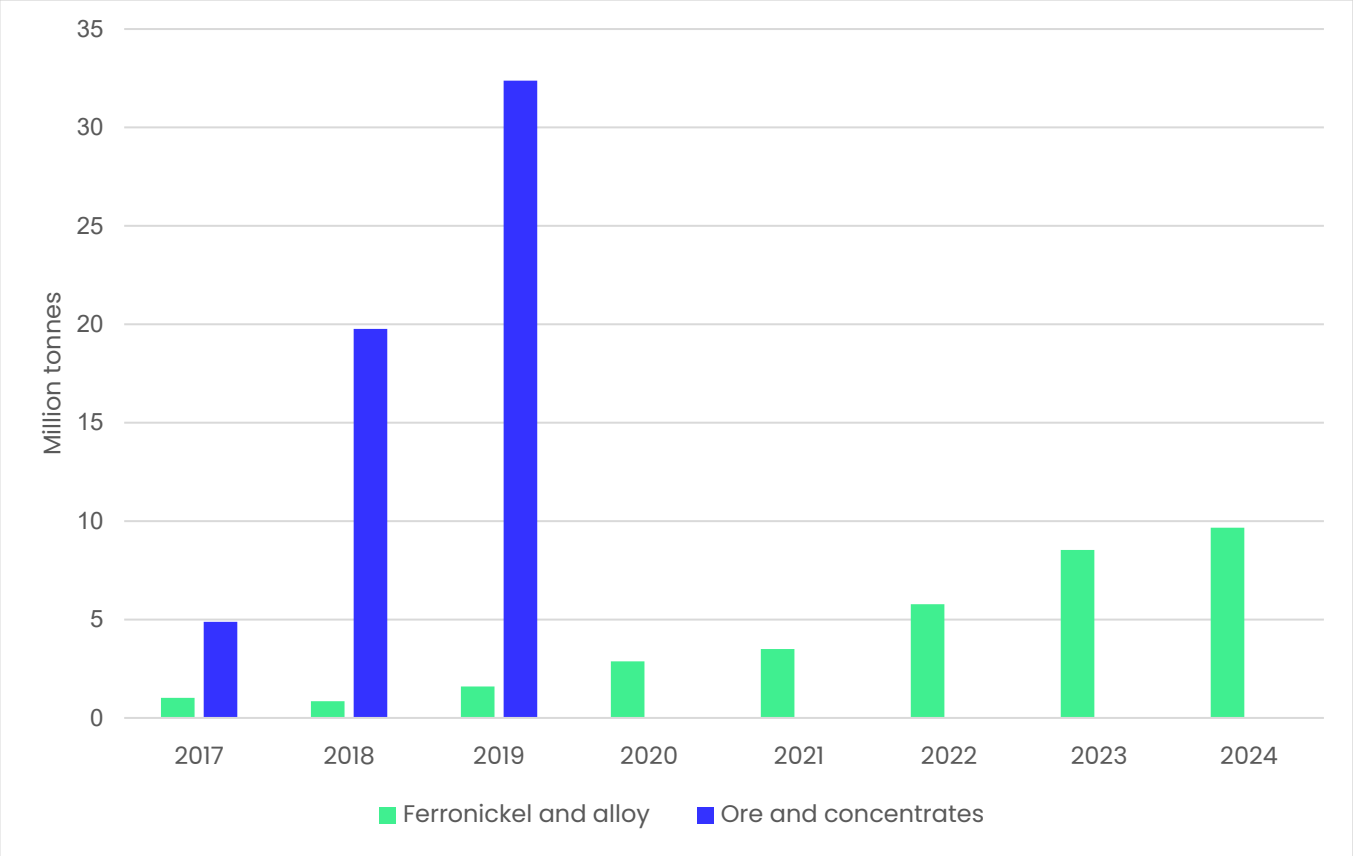
IMIP includes facilities ranging from coal-fired power generators to an airstrip, port facilities and a four-star hotel, all of which serve investors and workers in the park's mines and processing plants. This complex infrastructure project is financed by the Chinese multinational steel and nickel producer Tsingshan and several Chinese financial entities, including the China–ASEAN Investment Cooperation Fund, the China Development Bank, the Export–Import Bank of China, the Bank of China and the Industrial and Commercial Bank of China (Tritto, 2023). Much Chinese investment in Indonesia is driven

by China's Belt and Road Initiative and 'going out' strategy, a state-backed push for Chinese firms to invest abroad (Tritto, 2023; Brunelli, 2026). China's approach to FDI helped IMIP become the backbone of an integrated domestic nickel processing industry within less than a decade.

## Nickel exports and Indonesia's trade balance

**Indonesia's ban on exports of nickel ore shifted production and exports up the value chain to higher-priced ferronickel and alloy** (see Figure 2.4 below). Exports of ferronickel and alloy rose from less than 2 million tonnes in 2019 to almost 10 million tonnes in 2024, following the export ban in 2020.

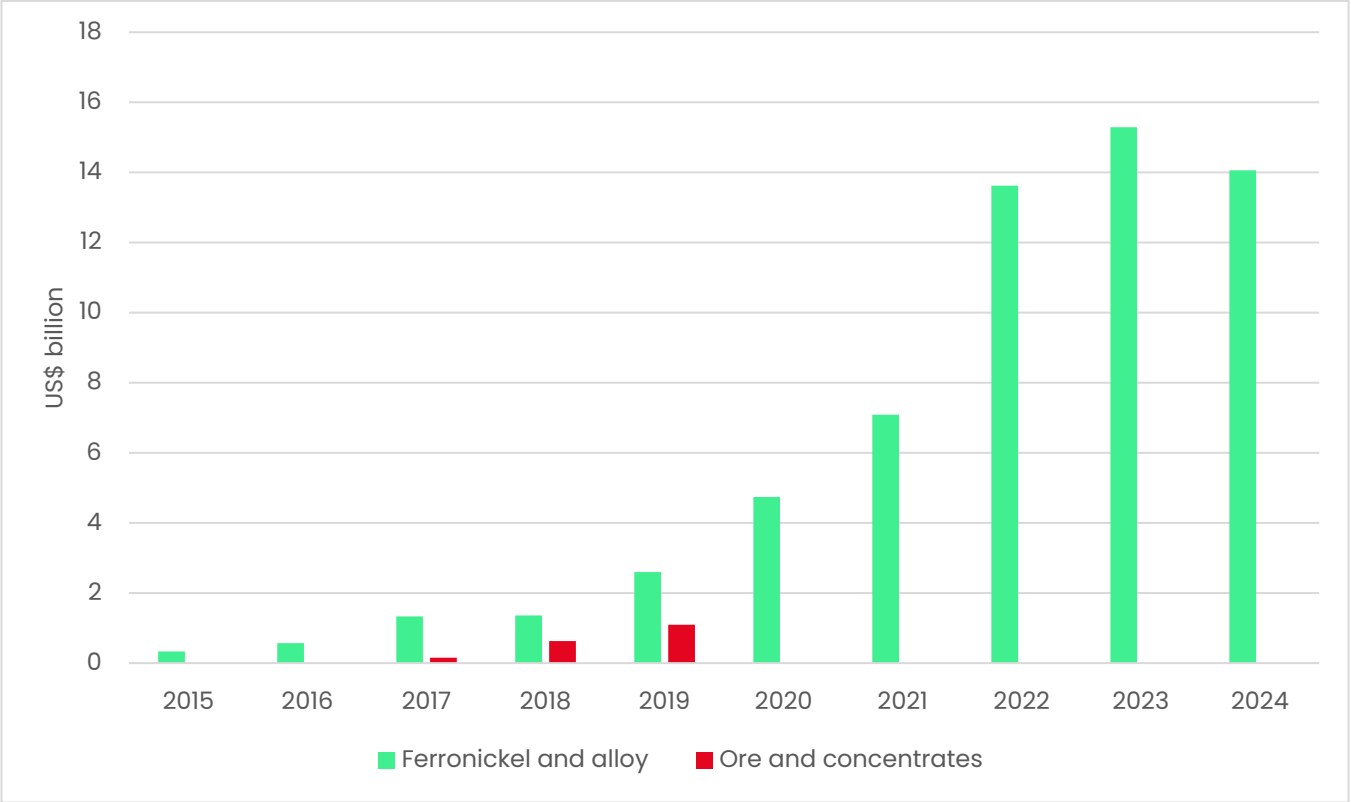
**Figure 2.4. Export volume of ore and concentrates, and ferronickel and alloy, 2017-24**




*Source: Authors' calculation based on BPS Statistic Indonesia data on ore and concentrates, and ferronickel and alloy, accessed November 2026.*

Accordingly, Indonesia has seen a sharp increase in the value of its nickel exports. Prior to the ban, the annual value of these exports peaked at around US$1 billion per year. By 2023, their value had reached around US$15 billion – before falling back to US$13.2 billion in 2024.

**Figure 2.5. Export value of ore and concentrates, and ferronickel and alloy, 2015-24**




*Source: Authors' calculation based on BPS Statistic Indonesia data on ore and concentrates, ferronickel and alloy, accessed November 2026.*

According to World Integrated Trade Solution trade data, more than 90% of Indonesia's ferronickel and alloy exports went to China in 2024 (WITS, 2024). Despite headlines linking Indonesia's nickel boom to the rise of EVs, the country's nickel production has long been oriented towards the stainless-steel sector (Brunelli, 2026). Thirty-five of Indonesia's operational smelters are rotary kiln electric furnaces producing ferronickel and NPI for this sector (Schreier et al., 2025).

Indonesia has continued integrating its economy into downstream nickel supply chains. In 2023, the country began exporting nickel sulphates, which are often used in EV batteries. Although it exports less nickel sulphate than ferronickel by volume, the value of the former (US$3.04 per kilogramme) was more than twice that of the latter (US$1.45 per kilogramme) in 2024 (see Figure 2.5 above). In other words, Indonesia's shift towards nickel sulphate exports is part of its gradual move towards higher-value production (see Table 2.1 below). With its production capacity continuing to rise, this shift may have an increasingly positive effect on the country's trade surplus and fiscal revenues.

**Table 2.1. Export value and volume of nickel sulphates, 2023-24**

| Year | Value (million US$) | Volume (tonnes) |
|---|---|---|
| 2023 | 234.4 | 66,640 |
| 2024 | 527.5 | 173,700 |
| Total | 761.9 | 240,140 |

*Source: Authors' calculation based on BPS Statistic Indonesia data, accessed November 2026.*

Exports of processed nickel contributed to Indonesia's trade surplus, increased market confidence in the country and provided it with an additional buffer against external shocks. This surplus reached US$41 billion in January–December 2025, the 68th consecutive month in which the country maintained a positive trade balance (see Table 2.2).

**Table 2.2. Indonesia's trade balance in US$ million, 2019–25**

| Month | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|
| January | −977 | −632 | 1,970 | 984 | 3,902 | 2,075 | 3,492 |
| February | 324 | 2,494 | 1,990 | 3,877 | 5,436 | 909 | 3,095 |
| March | 701 | 679 | 1,611 | 4,669 | 2,864 | 4,659 | 4,327 |
| April | −2,331 | −375 | 2,270 | 7,614 | 4,007 | 2,798 | 159 |
| May | 145 | 2,014 | 2,673 | 2,925 | 509 | 3,043 | 4,302 |
| June | 268 | 1,247 | 1,329 | 5,161 | 3,517 | 2,608 | 4,104 |
| July | −280 | 3,226 | 4,107 | 4,177 | 1,363 | 790 | 4,174 |
| August | 93 | 2,313 | 4,764 | 5,690 | 3,176 | 2,933 | 5,488 |
| September | −183 | 2,386 | 4,385 | 4,937 | 3,474 | 3,326 | 4,344 |
| October | 122 | 3,577 | 5,829 | 5,605 | 3,547 | 2,871 | 2,393 |
| November | −1,396 | 2,594 | 3,555 | 5,151 | 2,489 | 4,481 | 2,662 |
| December | −78 | 2,101 | 1,037 | 3,950 | 3,358 | 2,377 | 2,512 |
| **Total trade balance** | **−3,593** | **21,623** | **35,520** | **54,744** | **37,642** | **32,870** | **41,052** |

*Note: Surpluses are in green. Source: Authors' calculation based on BPS Statistic Indonesia data, accessed February 2026.*

Indonesia's total exports reached US$282.91 billion in 2025, up from US$266.53 billion in 2024 and US$259.53 billion in 2023 (Badan Pusat Statistik Indonesia [BPS], 2026b). Exports of ferronickel and nickel alloy amounted to around US$15 billion in 2023 and US$14 billion in 2024 (see Figure 2.5 above), roughly equivalent to 5% of total exports. These ferronickel and nickel alloy exports also contributed materially to Indonesia's external position, as shown in its trade surpluses of US$32 billion in 2024 and US$41 billion in 2025 (see Table 2.2 above).

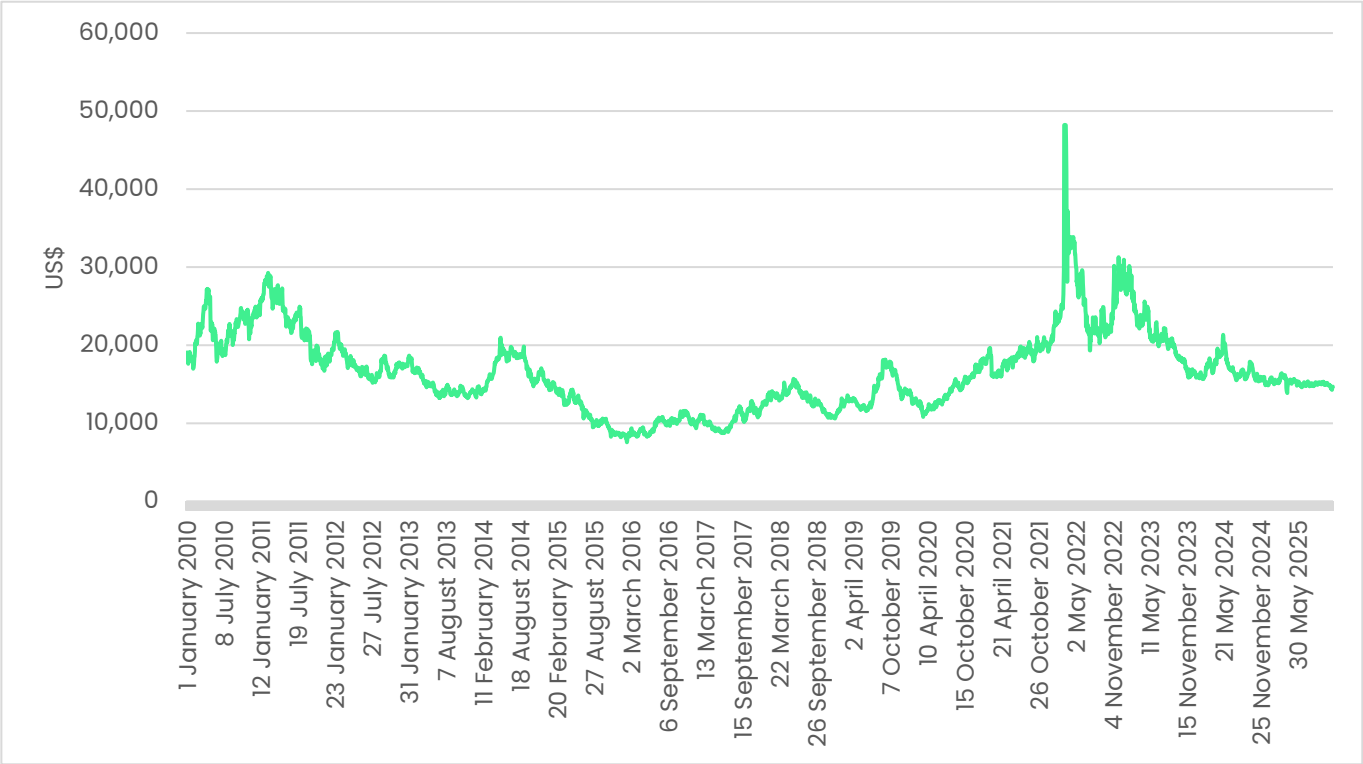
## Challenges in Indonesia's nickel industry

**Market distortions and oligopsony continue to pose challenges to Indonesia's nickel industry.** Domestically, while the export ban has allowed Indonesia to move up the nickel supply value chain, it has also effectively created an oligopsony in which Chinese-Indonesian smelting consortia can dictate the market price and reduce the profit margins of all mining companies in the country. The

resulting pressure has led to intensifying competition between small- and large-scale mining firms. Reportedly, large companies have reneged on territorial agreements with their smaller rivals, while smaller firms have encroached on the concessions of these larger companies to obtain higher-grade ores, raising the environmental costs of nickel production (Camba, 2021).

**Fluctuations in the price of nickel are creating vulnerabilities for Indonesia.** The country continues to expand its nickel production despite the fact that the price of ferronickel and alloy has fallen from its record high in 2022. This high resulted from supply disruptions linked to Russia's full-scale invasion of Ukraine, as well as diverging views on the medium-term outlook for the market (London Metal Exchange, 2023). With nickel prices having plummeted to around half their 2022 peak due to oversupply, there is a risk that Indonesia's approach to the market will sour (see Figure 2.6 below). In response to severe financial pressure and the cost of exploration and production, Indonesian refiners have resorted to reducing output and laying off workers (Lakshmi and Mariska, 2025). Lower prices have also reduced the nickel output of other producer countries, which are unable to compete (Capolingua, 2024). Most observers expected Indonesia's resource nationalism to fade once the global commodity boom ended but, despite these difficult economic circumstances, the government remains committed to this approach (Warburton, 2017).

**Figure 2.6. Nickel price per tonne, 2010-25**




*Sources: London Stock Exchange; Refinitiv.*

**Nickel's global competitiveness is in question.** Export restrictions can have unintended global consequences, particularly through their impact on international price formation. In the nickel market, limited supply and the associated upward price pressures encouraged market participants to invest in other technologies to offset their dependence on the commodity. This dynamic was similar to that in the rare earths market, where China's export restrictions led to a global surge in innovation and exports in downstream sectors elsewhere (Alfaro et al., 2025). Protectionist policies can also lead to retaliation and legal action – as Indonesia discovered in 2021, when the EU successfully sued the country for its ban on raw nickel exports at the World Trade Organisation (Warburton, 2024).

**The nickel industry faces shifting investment dynamics.** As Indonesia's nickel industry grew, an LG-led consortium indicated its interest in investing US$7.7 billion in the country's battery ecosystem. However, after five years of stalled negotiations, the consortium withdrew its plans for the project, which was designed to vertically integrate every stage of battery production, from nickel mining to the

manufacture of finished products. Conflicting narratives have emerged regarding the cancellation of the investment: LG cited shifting market dynamics and slowing demand for EVs (Guild, 2025), while the government stated that the negotiations took too long (Antara, 2025).

Consequently, Indonesia asked Huayou, a Chinese technology company, to lead a similar consortium. By April 2025, the company had invested US$8.8 billion in the project. Huayou has developed industrial parks in several locations to support downstream nickel processing and battery material production, including Weda Bay in Central Halmahera (North Maluku), Morowali and Pomalaa (Central and Southeast Sulawesi (Dwibaskoro, 2025). Furthermore, Huayou has engaged in strategic cooperation with state-owned companies ANTAM and Indonesia Battery Corporation to accelerate the development of an integrated battery ecosystem in Indonesia (PT Antam, 2026b).

China's initial investment in Indonesia's nickel industry initially focused on rotary kiln electric furnace smelters producing NPI and ferronickel for stainless steel. However, China's most consequential recent contribution has been the commercialisation of high-pressure acid leaching technology, an effort led by Tsingshan in partnership with GEM, CATL and Hanwa (Brunelli, 2026). This technology converts low-grade laterite into mixed hydroxide precipitate, a material used in the production of EV batteries (Brunelli, 2026). GEM and CATL are battery manufacturer firms based in China, while Hanwa has partnered with Tsingshan in Indonesia on stainless steel production (Hanwa, 2026).

**The development of new mining areas poses environmental risks.** As discussed, demand for nickel has driven the expansion of new mining areas in Indonesia, especially in Raja Ampat. This part of Papua contains rich and diverse marine ecosystems that are home to 75% of all known coral species and more than 1,500 species of fish (Parkes, 2025). Raja Ampat is also a UNESCO Global Geopark, as it includes some of the oldest exposed rock on earth, capturing nearly one-tenth of the planet's geological history (UNESCO, 2023). Mining in the area has produced a public backlash linked to concerns about the threat to marine biodiversity. Public protests and other forms of resistance prompted the government to revoke the licences of four of five companies operating there (Gill, 2025).

# 3. Economic and fiscal impacts of nickel mining

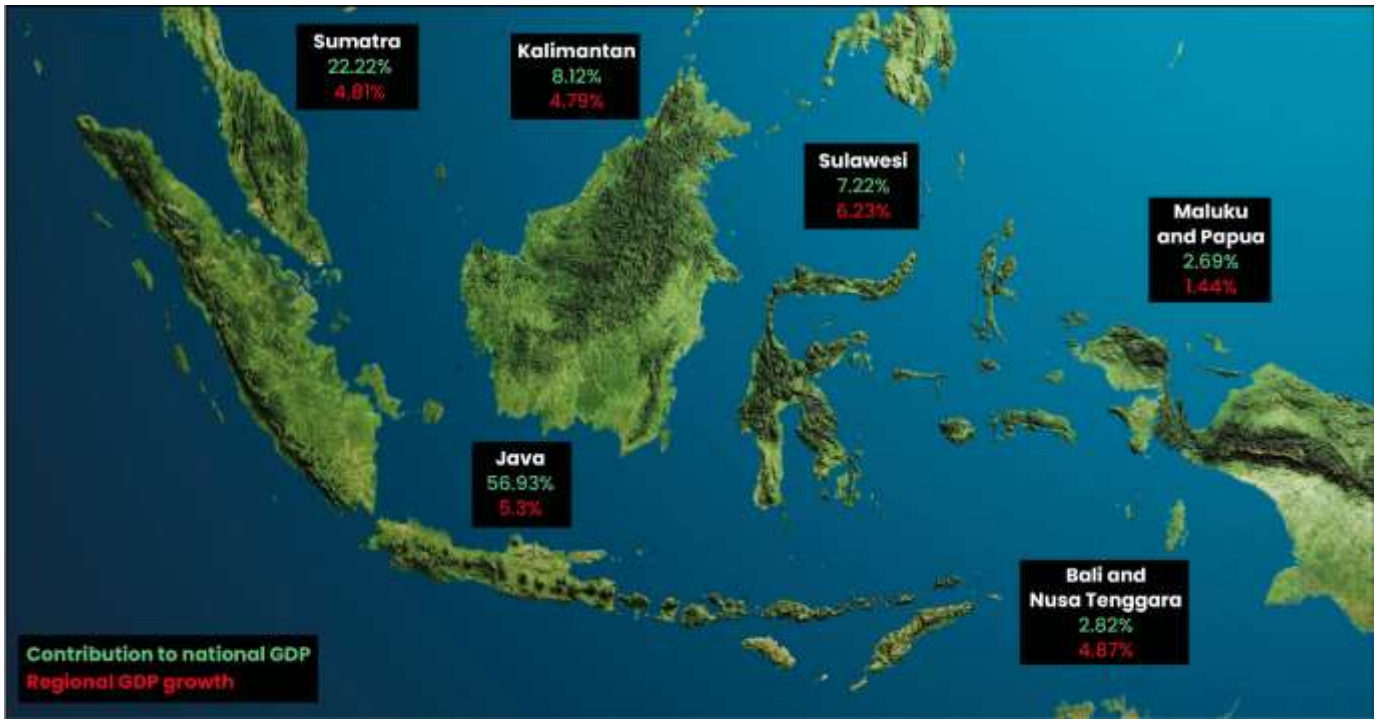
Indonesia's mineral resources sector has long been an important pillar of the national economy. Changes in GDP growth, government revenues and employment outcomes reveal the economic and fiscal effects of the country's rapid expansion of nickel mining and downstream activity since it banned exports of raw nickel. This section explores the new economic opportunities and additional fiscal revenues that the ban has generated, along with the fiscal and monetary policy that has helped the country maintain its macroeconomic resilience.

## GDP growth

### National overview

Indonesia's economy grew by 5.11% in 2025, compared to 5.03% in 2024 (BPS, 2026a). Exports of goods and services accounted for around one-third of this growth in 2025 (ibid). Manufacturing accounted for 19.07% of GDP, construction 9.83%, and mining and quarrying 8.75% (ibid). As Figure 3.1 below shows, Java continued to be the main driver of the national economy (56.93%), with a group of provinces on Sumatra Island the second-largest contributor (22.22%), followed by Kalimantan (8.12%), Sulawesi (7.22%), the Bali and Nusa Tenggara Islands (2.82%), and the Maluku and Papua Islands (2.69%). Sulawesi Island, the location of the IMIP and Sorowako mines, experienced the highest regional GDP growth at 6.23%.

**Figure 3.1. Indonesia regional GDP contribution and growth, 2025**




*Source: BPS Statistic Indonesia, 5 February 2026.*

## Nickel-producing regions

Between 2010 and 2025, Central Sulawesi experienced a 345% increase in GDP and North Maluku a 399% increase (see Table 3.1 below). This far exceeded the national level of 98%.

**Table 3.1. Central Sulawesi, North Maluku and national GDP in billion IDR, 2010–25**

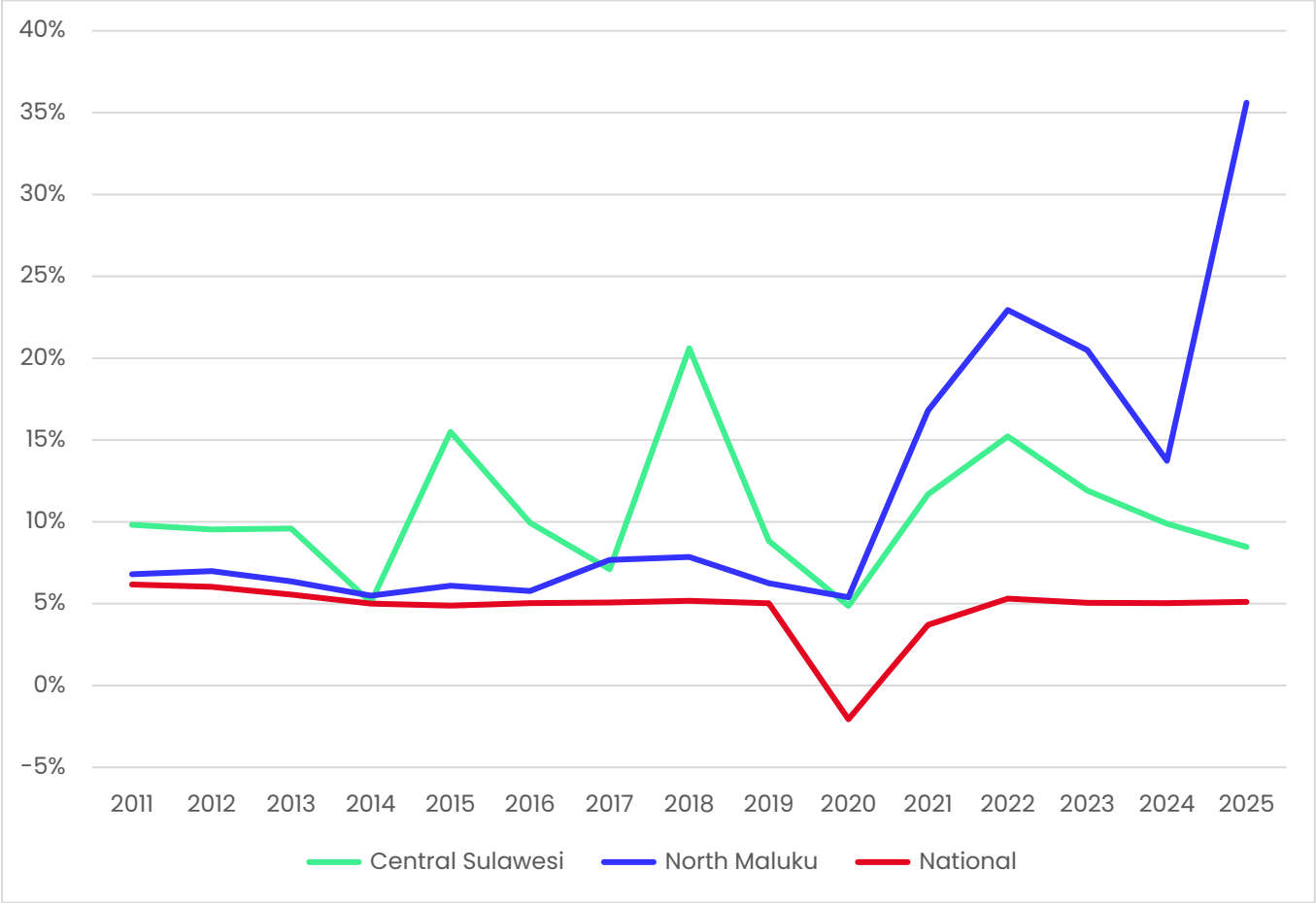
| Year | Central Sulawesi (GDP) | North Maluku (GDP) | National (GDP) | Share of Central Sulawesi (%) | Share of North Maluku (%) |
|---|---|---|---|---|---|
| 2010 | 51,752 | 14,984 | 6,864,133 | 0.75% | 0.22% |
| 2011 | 56,834 | 16,002 | 7,287,635 | 0.78% | 0.22% |
| 2012 | 62,250 | 17,120 | 7,727,083 | 0.81% | 0.22% |
| 2013 | 68,219 | 18,209 | 8,156,498 | 0.84% | 0.22% |
| 2014 | 71,678 | 19,209 | 8,564,867 | 0.84% | 0.22% |
| 2015 | 82,787 | 20,380 | 8,982,517 | 0.92% | 0.23% |
| 2016 | 91,015 | 21,557 | 9,434,613 | 0.96% | 0.23% |
| 2017 | 97,475 | 23,211 | 9,912,928 | 0.98% | 0.23% |
| 2018 | 117,556 | 25,034 | 10,425,852 | 1.13% | 0.24% |
| 2019 | 127,935 | 26,598 | 10,949,155 | 1.17% | 0.24% |
| 2020 | 134,153 | 28,031 | 10,722,999 | 1.25% | 0.26% |
| 2021 | 149,816 | 32,739 | 11,120,060 | 1.35% | 0.29% |
| 2022 | 172,625 | 40,248 | 11,710,223 | 1.47% | 0.34% |
| 2023 | 193,181 | 48,495 | 12,301,453 | 1.57% | 0.39% |
| 2024 | 212,282 | 55,152 | 12,920,532 | 1.64% | 0.43% |
| 2025 | 230,265 | 74,790 | 13,580,525 | 1.70% | 0.55% |
| 2010–25 growth | 345% | 399% | 98% | | |

*Note: constant prices 2010. Source: Authors' calculation based on BPS Statistic Indonesia data, accessed February 2026.*

As shown in Figure 3.2, Central Sulawesi and North Maluku achieved steady growth before experiencing a significant shift after 2014, when the government first implemented the ban on exports of nickel ore.

While other factors are at play, there is a strong correlation between changes in government policy, nickel price dynamics and economic growth in the country's main nickel-producing regions.

**Figure 3.2. GDP growth, 2011–25**



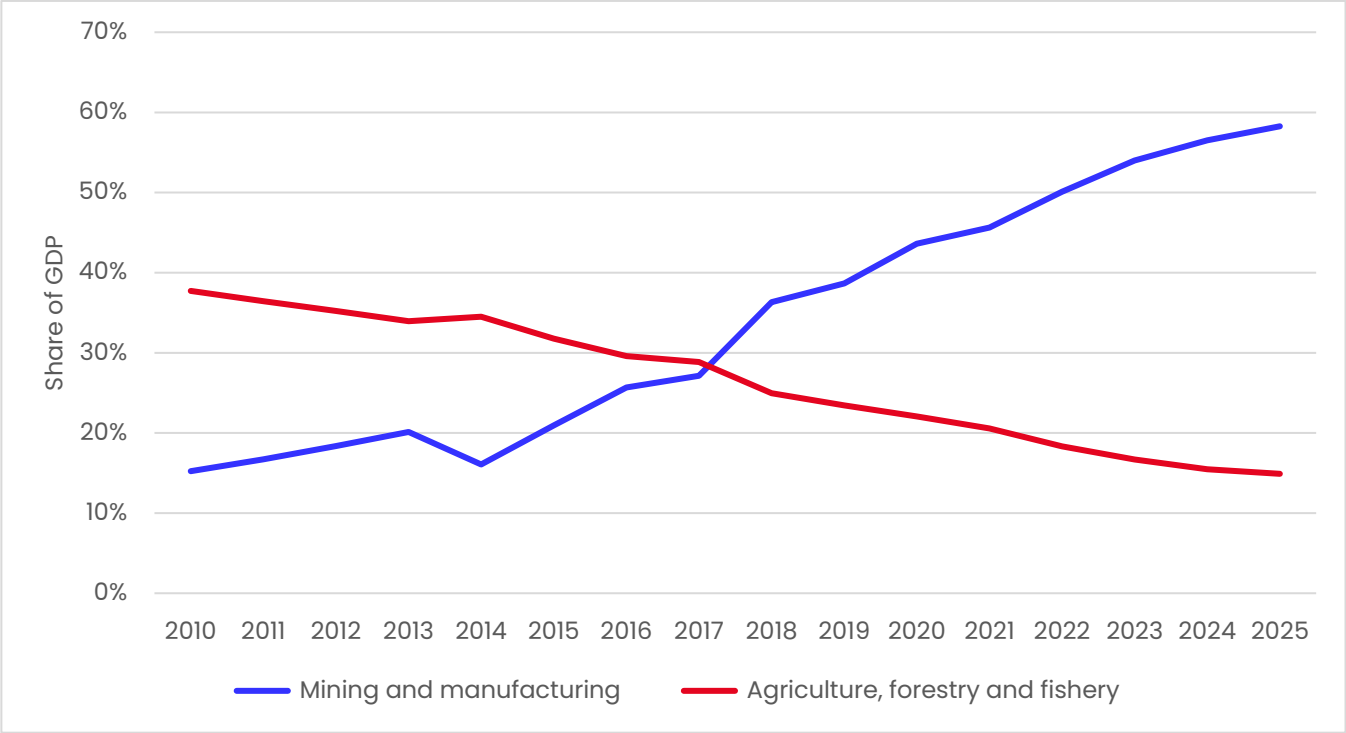

*Note: Constant prices 2010. Source: Authors' calculation based on BPS Statistic Indonesia data, accessed February 2026.*

The export ban might explain the decline in the regional growth rate in Central Sulawesi from 2013 to 2014, temporarily bringing it in line with national growth. After IMIP started operations in 2015, the region experienced a sharp rise in growth. The government responded to the decline in nickel production in 2016 by relaxing the ban the following year – which, again, coincided with an increase in GDP growth in Central Sulawesi. The economies of Central Sulawesi and North Maluku continued to grow throughout the COVID-19 shock in 2020, even as the national economy slipped into recession. Changes in North Maluku's growth dynamics have been particularly evident since 2021, in line with IWIP beginning operations in 2020. The peak nickel price in 2022 appears to explain why both regions experienced such strong GDP growth that year, as well as the subsequent slowdown. The promising jump in North Maluku's growth in 2025 correlates with an increase in nickel production, refining capacity and the development of EV battery supply chains in the province.

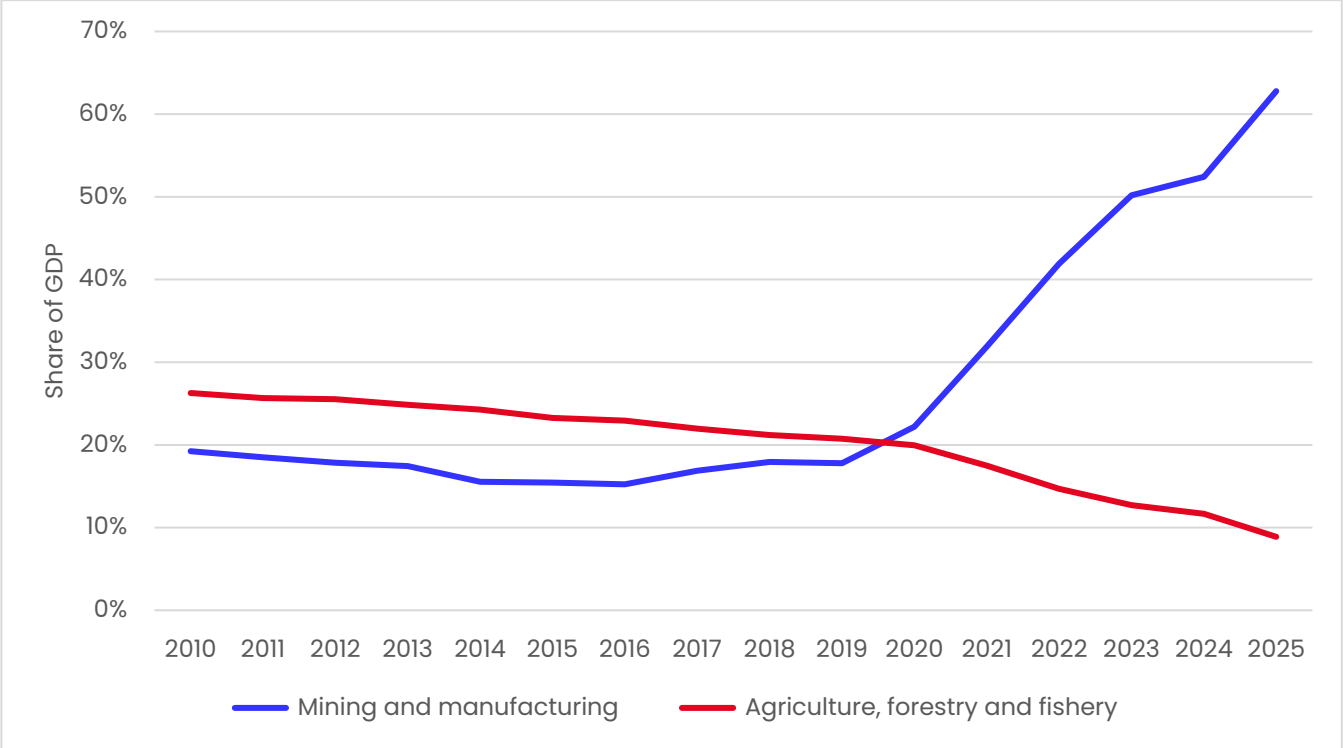
Mining and manufacturing have increased their share of regional GDP in the last decade and a half, with the agriculture, forestry and fishing sectors trending in the opposite direction. In 2010, the mining and manufacturing sectors accounted for 15.23% of GDP in Central Sulawesi. By 2025, this had risen to 58.27%. North Maluku experienced a similar trend, with the two sectors' share of GDP increasing from 19.24% to 62.78% during the same period (see Figure 3.3 below).

**Figure 3.3. Share of GDP in mining and manufacturing, and agriculture, forestry and fishery, 2010–25**

**Central Sulawesi**




**North Maluku**




*Note: constant prices 2010. Source: Authors' calculation based on BPS Statistic Indonesia data, accessed February 2026.*

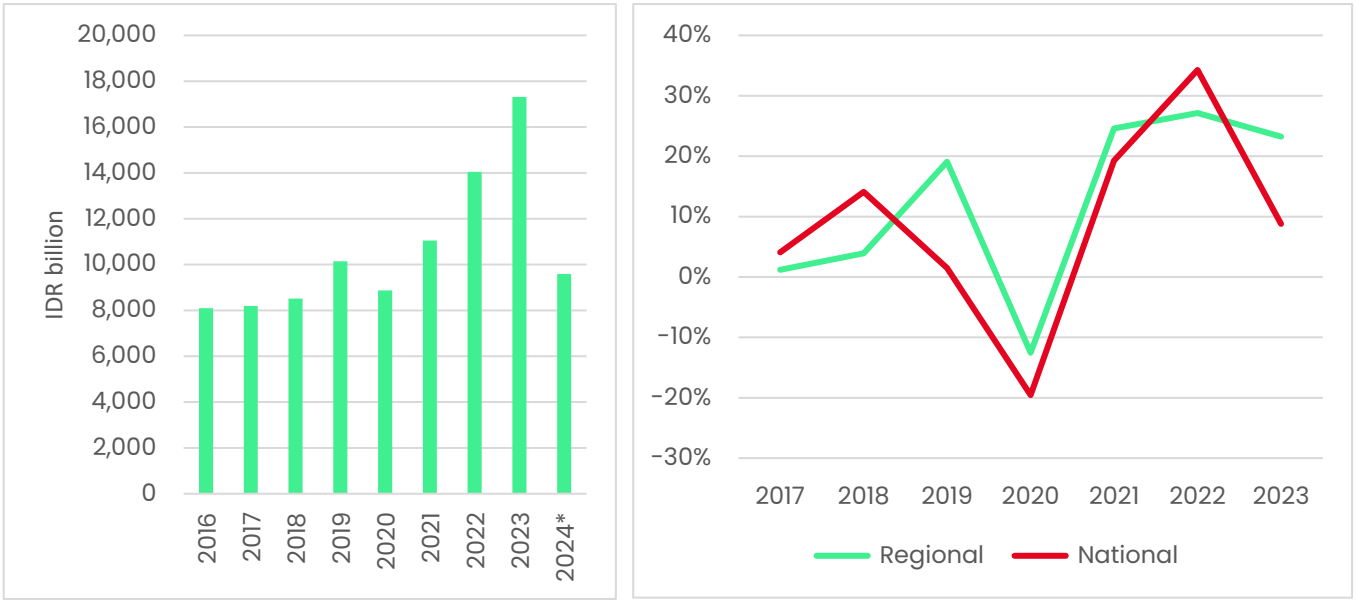
# Government revenue

## Nickel production and the national economy

Nickel mining and manufacturing have boosted the Indonesian government's revenue generation at both the national and subnational levels. Economic development more broadly has driven administrative reforms at the Directorate General of Taxes (DGT), such as the relocation of tax offices to areas experiencing rapid growth, an initiative designed to improve oversight of taxpayer compliance. For example, as IMIP became the epicentre of economic activity in Morowali Regency under the administration of the Poso Tax Office, the DGT relocated the office from an area near the city centre to one near IMIP and placed it under the administration of the Tax Service and Dissemination Office Bungku. This reflected a shift in the government's priorities towards greater control of taxation in the region, as the Poso Tax Office was providing full tax administration services, including compliance and enforcement, while the Tax Service and Dissemination Office had a more limited role. Such administrative reforms demonstrate the DGT's responsiveness to economic development and its associated potential fiscal benefits.

Figure 3.4 draws on data from the Regional Tax Office of North and Central Sulawesi, Gorontalo and North Maluku to show the fluctuation in tax revenue in areas dominated by nickel production since 2016 (with the caveat that the industry is less important in North Sulawesi and Gorontalo than in the other two regions).

**Figure 3.4. Tax revenue collected by the Regional Tax Office of North and Central Sulawesi, Gorontalo and North Maluku in IDR billion (left), and national and regional growth (right), 2016–23**

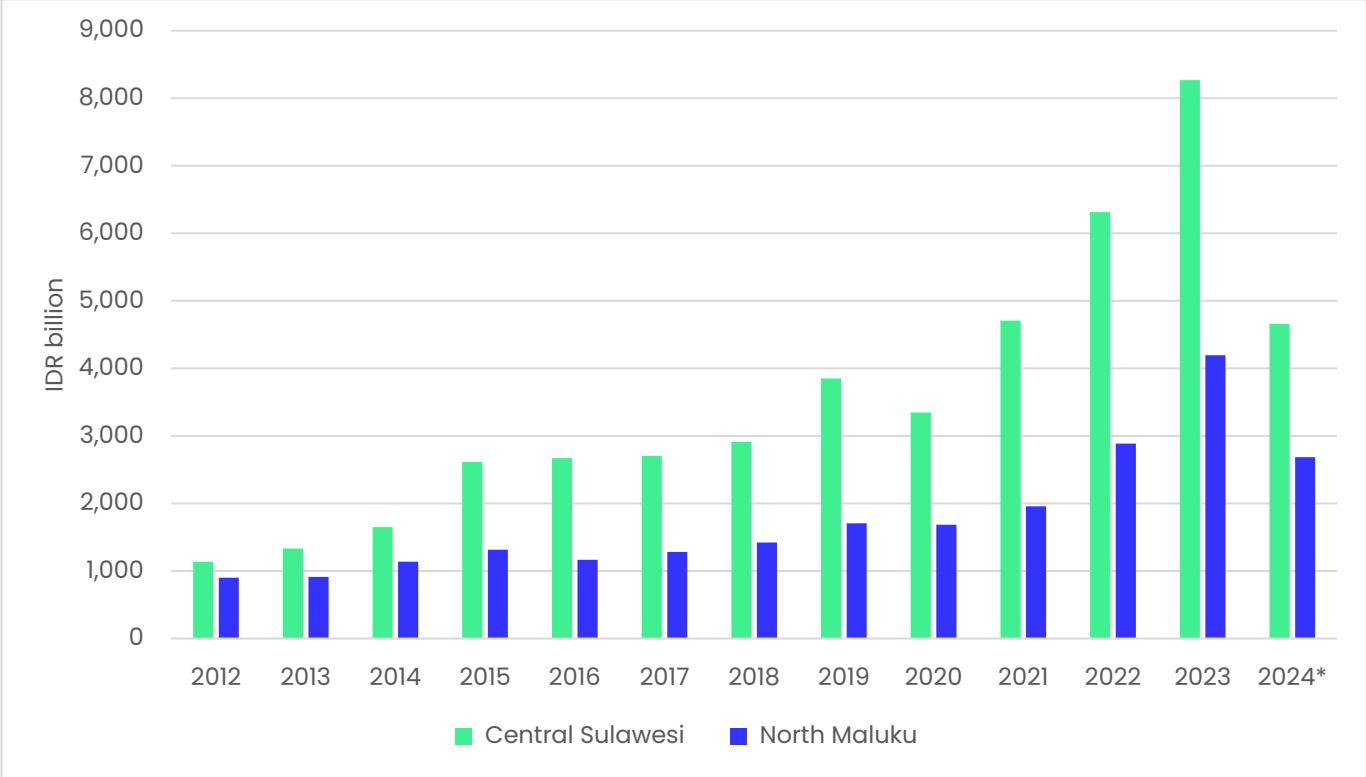



**Note: 2024 statistics are for the first half of the year. Source: Authors' analysis of Buku Saku Penerimaan Pajak 2020–24.*

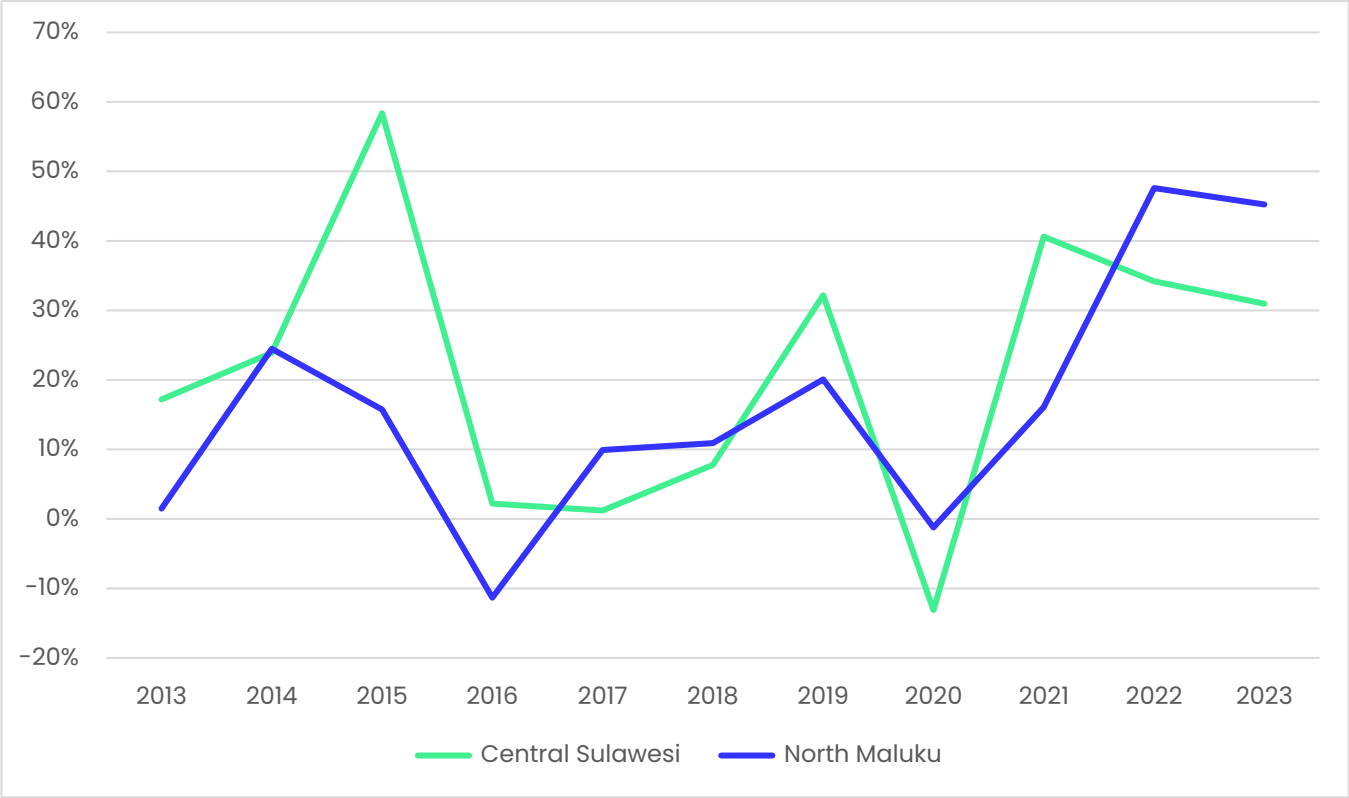
Tax revenue growth in North and Central Sulawesi, Gorontalo and North Maluku has been broadly aligned with the national rate, albeit while outpacing this in several years, particularly 2019, 2020, 2021 and 2023. In 2023, the tax office covering these provinces collected a record US$1 billion in revenue. While this was less than 1% of national tax revenue, it was 23% more than in 2022 – the second-highest growth rate in the country, and far higher than the national rate of 8%. Accordingly, the tax office reported collecting 122.68% of its 2023 revenue target.

Provincial tax revenue figures derived from the DGT's head office show that Central Sulawesi recorded its highest tax revenue growth in 2015 with an increase of almost 60%, and North Maluku in 2022 with an increase of 50% (see Figure 3.5 below). Substantial tax revenue expansion in both provinces correlated with the rapid development of industrial parks for nickel production in these areas, even with the government foregoing significant amounts of revenue via tax incentives designed to develop the industry.

**Figure 3.5**
**Tax revenue in Central Sulawesi and North Maluku, 2012–24**



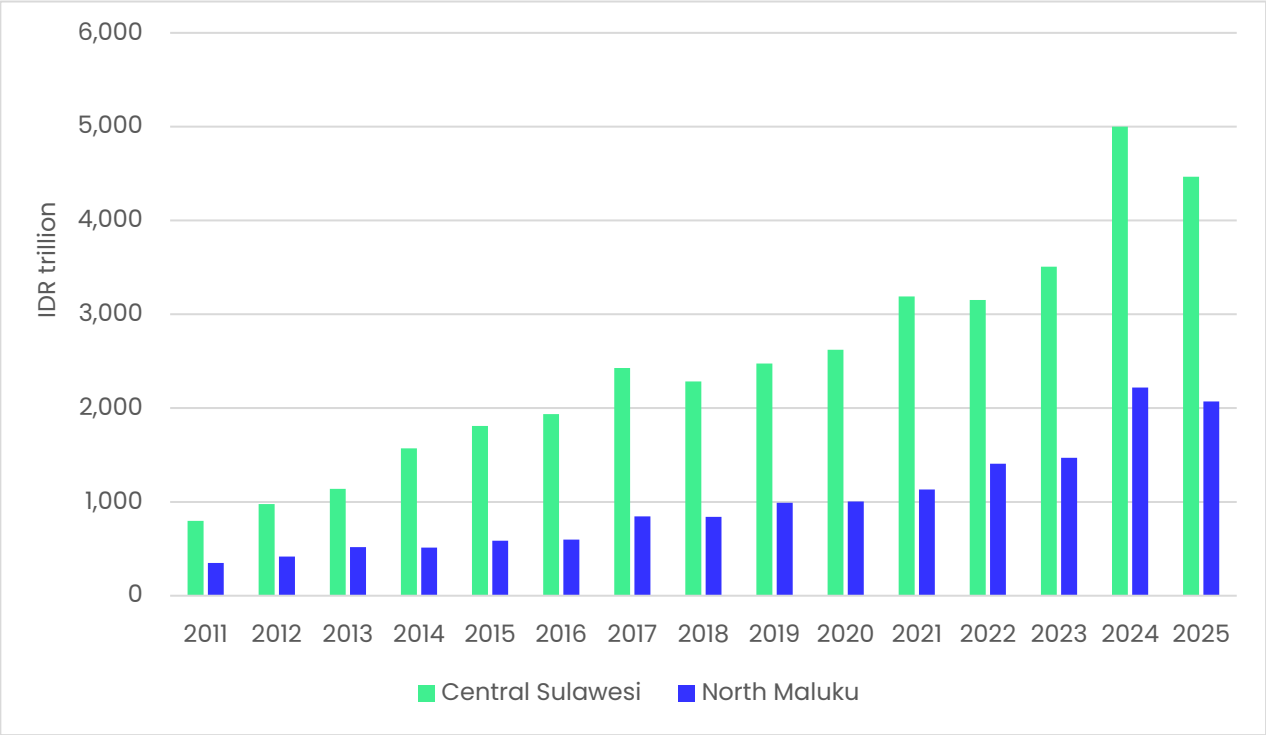

**Growth in tax revenue in Central Sulawesi and North Maluku, 2012–24**



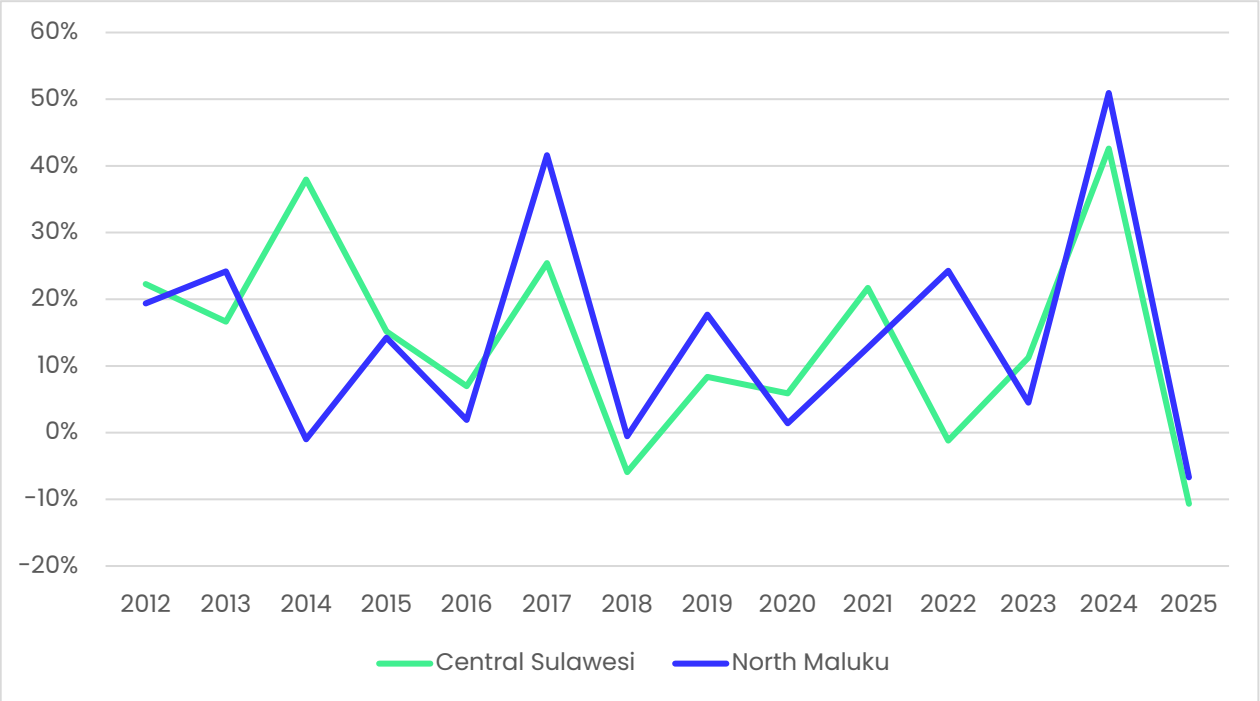

**Note: 2024 statistics are for the first half of the year. Source: Authors' analysis of DJP (2020, 2024).*

The government also collected non-tax revenue, such as royalties and land rent, in nickel-producing areas. As shown in Figure 3.6 below, coal and minerals accounted for a growing share of national non-tax revenue between 2012 and 2025 (with the caveats that the Indonesian government's statistics group nickel with other minerals in this measure of revenue, and that its approach to classification differs from that of countries and international organisations that include mining royalties in general tax revenue).

**Figure 3.6.**
**Non-tax revenue from natural resources, 2012–25**




**Share of non-tax revenue from natural resources, 2012–25**




*Sources: Ministry of Finance (2017, 2022, 2026a); authors' analysis.*

## Subnational government revenue in nickel-producing regions

At the subnational level, provincial and regency governments in nickel-producing regions have experienced a growth in revenue through the following channels:

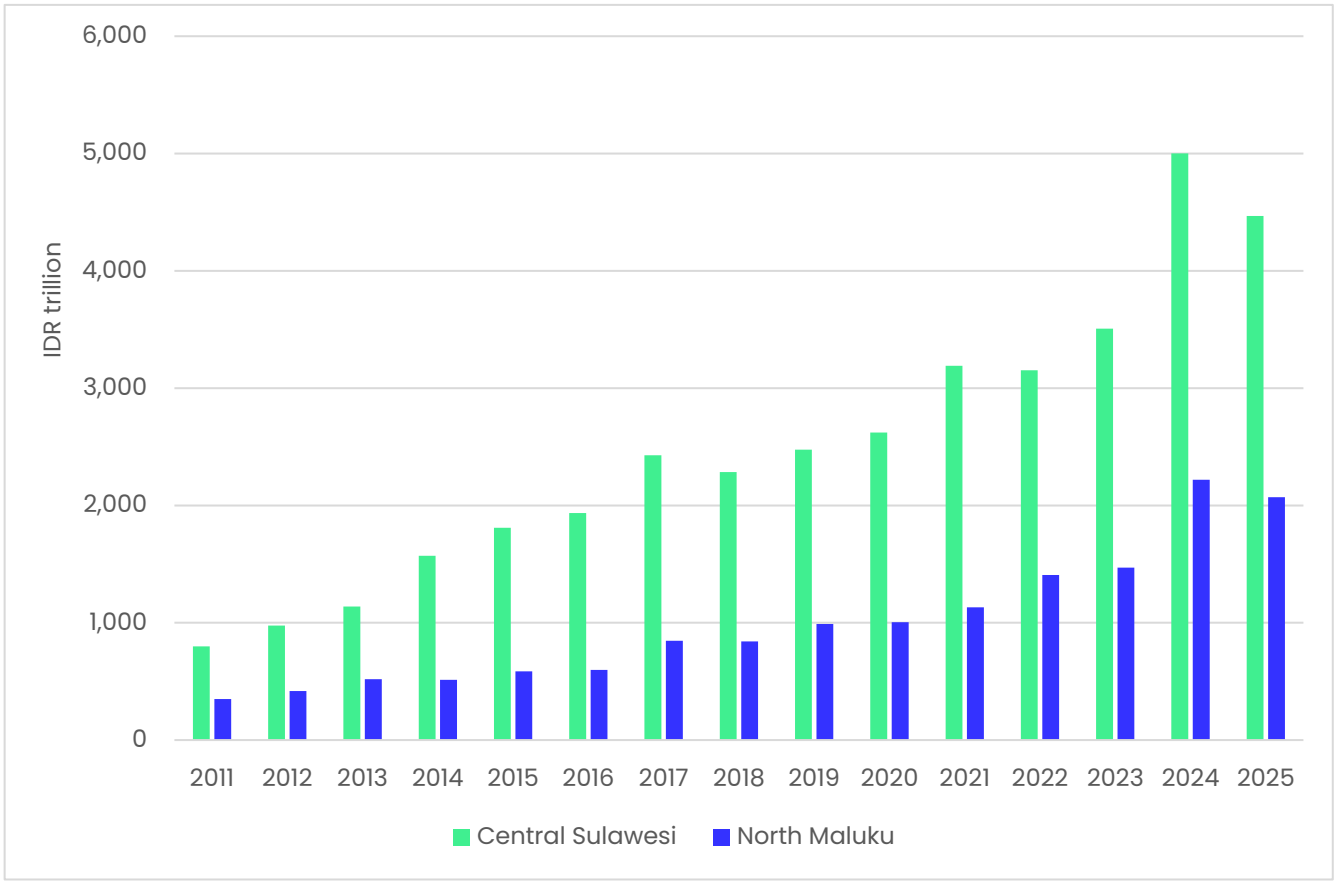
1. Pendapatan Asli Daerah (PAD) – locally generated or own-source revenue.

2. Transfer ke Daerah dan Dana Desa (TKDD) – transfers from the national government to regions and village funds. (Further analysis of the impact of nickel mining on revenue and expenditure at the subnational level will feature in a forthcoming policy report by these authors.)

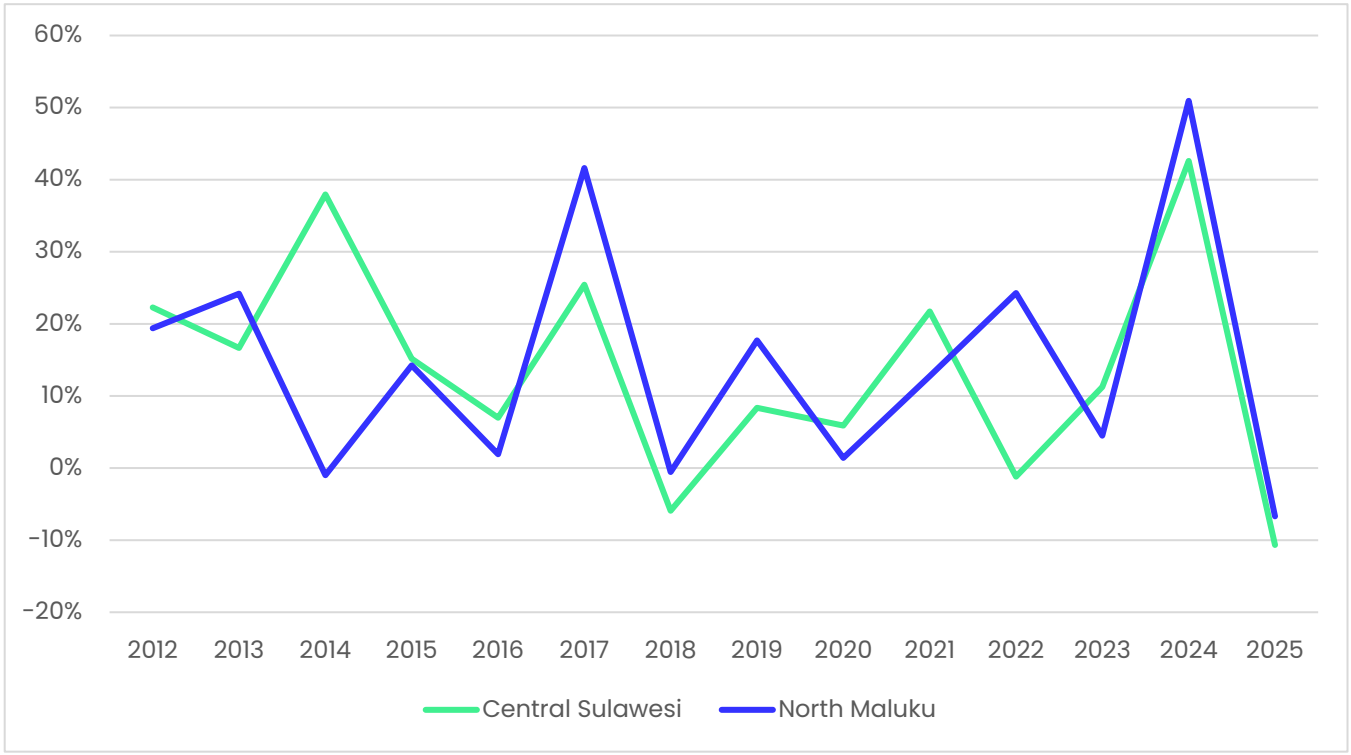
3. Pendapatan lainnya – other income.

Although there is no clear one-to-one relationship between nickel production and PAD collection in these regions, PAD remains an important indicator of changes in a local government's own-source revenue capacity. In practice, higher PAD tends to reflect stronger local tax bases and administrative capability, as it often rises with broader economic development and the expansion of individual sectors at the regional level. PAD includes local tax, local retribution, asset management revenue and sources of income such as interest, exchange-rate gains, and the proceeds of asset sales. As shown in Figure 3.7 below, there was a marked increase in PAD in Central Sulawesi and North Maluku between 2011 and 2025. This accounted for sources of revenue such as taxes on motor vehicles, fuel, land and buildings, hotels and restaurants, advertising, entertainment, water, and non-metal mineral and rock resources. These sources of revenue also include local governments' user charges (fees paid by individuals or firms in exchange for specific public services, permits or licenses).

**Figure 3.7**
**Locally generated revenue in Central Sulawesi and North Maluku, 2011–25**



**GDP growth in Central Sulawesi and North Maluku, 2011–25**




*Sources: Authors' calculation based on Ministry of Finance (2026b); Portal for Regional Budget, Directorate General of Fiscal Balance, accessed February 2026.*

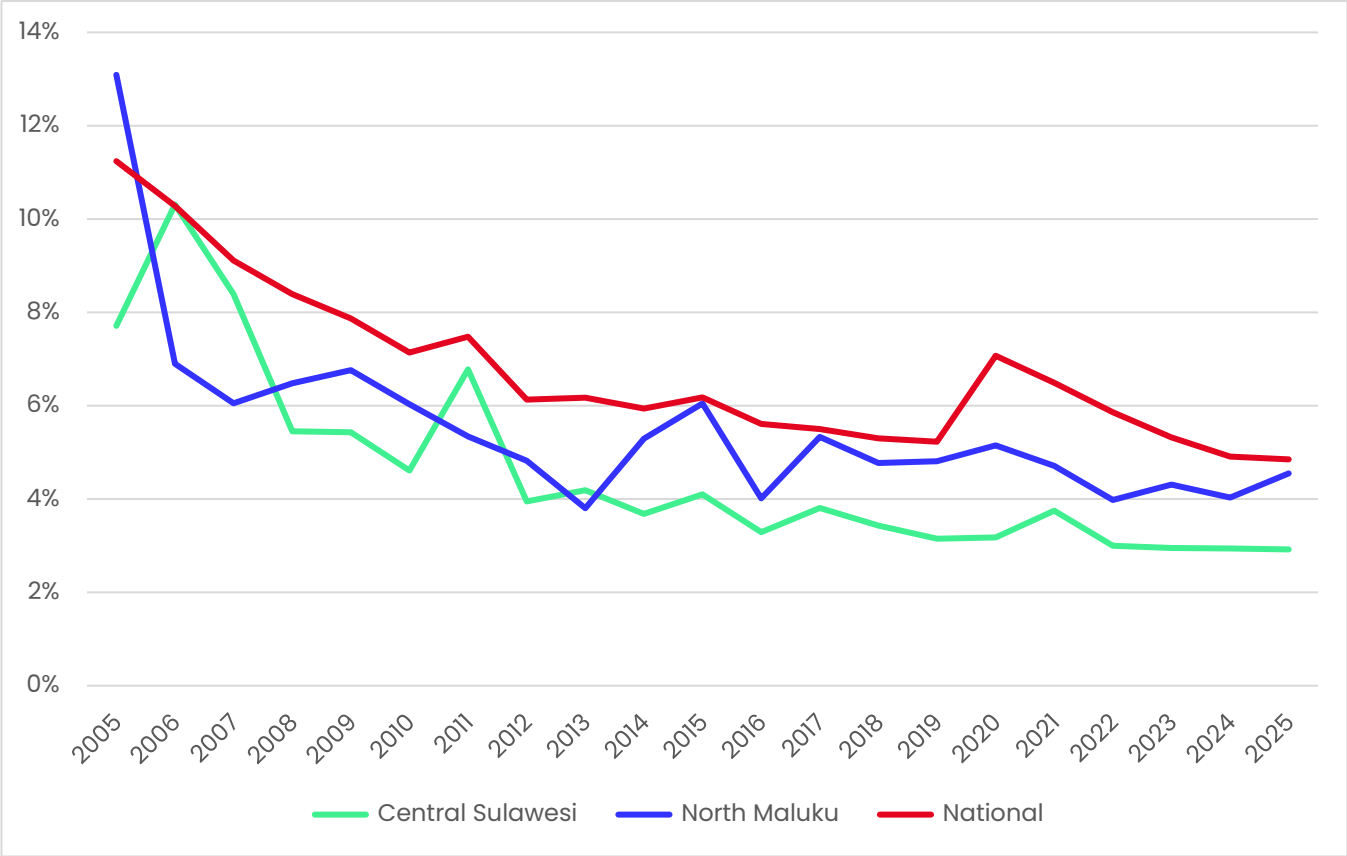
The provincial government of Central Sulawesi recorded a 460% growth in PAD collection between 2011 and 2024. Similarly, its counterpart in North Maluku recorded a 492% growth in PAD collection during the same period. The decline in PAD collection in both regions in 2025 appears to be partly explained by price dynamics that increased the pressure on nickel producers.

## Employment

### National employment rate

The unemployment rate in Central Sulawesi and North Maluku has decreased in the last two decades, as it has at the national level, despite fluctuations related to the COVID-19 shock (see Figure 3.8 below). Large-scale mining expansion in the two regions has provided new job opportunities and higher pay for the local workforce. This can be partly attributed to IWIP, which employed more than 24,000 workers in 2021, and IMIP, which employed approximately 120,000 contractors and other workers, including 11,000 Chinese workers and 4,000 other foreign workers (Institute for Economic and Social Research [LPEM], 2025; Santosa, 2024).

**Figure 3.8. Unemployment rate in Central Sulawesi and North Maluku, and at the national level, 2005–25**




*Source: Authors' calculation based on BPS Statistic Indonesia data, accessed November 2025.*

Indonesia's national population data 2020 (BPS, 2025a) show that Java Island is inhabited by 151.6 million people, or 56.1% of the Indonesian population, while Sulawesi and Maluku-Papua are inhabited by 7.36% and 3.27% respectively. Yet, as shown in Table 3.2 below, Central Sulawesi and North Maluku combined are home to just 1.2% of unemployed people nationwide.

**Table 3.2. Unemployment rate and number of unemployed people in Central Sulawesi, North Maluku and at the national level, 2024**

| Unemployment | National | Central Sulawesi | North Maluku |
|---|---|---|---|
| Unemployment rate (%) | 4.91% | 2.9% | 4.03% |
| Person unemployed | 7,466,000 | 48,434<br>(0.65% of unemployed people nationwide) | 27,747<br>(0.37% of unemployed people nationwide) |

*Source: Authors' calculation based on BPS Statistic Indonesia data (2025b, 2025c) and labour survey, accessed November 2025.*

In Central Sulawesi, the net monthly salary of workers in the mining and manufacturing sectors averaged approximately US$220, significantly higher than the provincial average of around US$165, in 2024 (see Table 3.3 below).

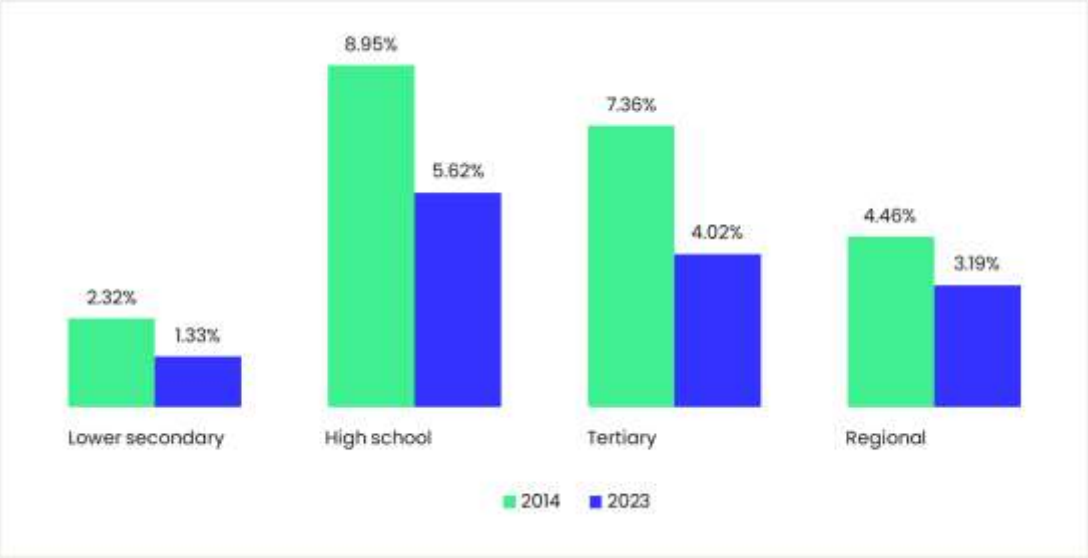
| Table 3.3. Net monthly salary of employees by main industry in Central Sulawesi, North Maluku and at the national level, 2024 | | |
|---|---|---|
| Main industry | Central Sulawesi | North Maluku |
| Agriculture, forestry and fishing | $120 | $97 |
| Mining and quarrying; manufacturing; electricity and gas; water supply; sewerage, waste management and remediation activities; construction | $220 | $125 |
| Wholesale and retail trade; repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities; information and communication; financial and insurance activities; real estate; business services activities; public administration and defence; compulsory social security; education; human health and social work; other services | $165 | $151 |

*Source: Authors' calculation based on BPS Statistic Indonesia data (2025b, 2025c) and labour survey, accessed November 2025.*

## Employment opportunities in nickel-producing regions

Mining-related activities have become an increasingly important part of the regional economies and employment dynamics of 13 regencies in Central Sulawesi and North Maluku: Morowali (including the newly formed North Morowali); East Luwu; Kolaka (including the newly formed East Kolaka); North Kolaka; Konawe; North Konawe; Bombana; Buton; North Buton; Central Halmahera; East Halmahera; South Halmahera; and Seram Bagian Barat (all matched to the previous nomenclatures and region).[1]

**Figure 3.9. Unemployment rate by education level, and regional unemployment rate, 2014 and 2023**




*Note: Figures weighted by labour force size to reflect conditions across the 13 regencies. Source: Authors' calculation based on SAKERNAS data for 2014 and 2023.*

[1] The national labour survey (*Survei Angkatan Kerja Nasional*, SAKERNAS) 2014 refers to 13 regencies and SAKERNAS 2023 to 15 regencies. Therefore, to ensure comparability, we matched the 15 regencies with the grouping SAKERNAS used in 2014. The analysis did not account for worker migration, either for neighbouring regions or other provinces, due to the nickel boom. Such migration may affect employment metrics: for example, mining companies may require experienced, skilled workers who are unavailable in the local labour force.

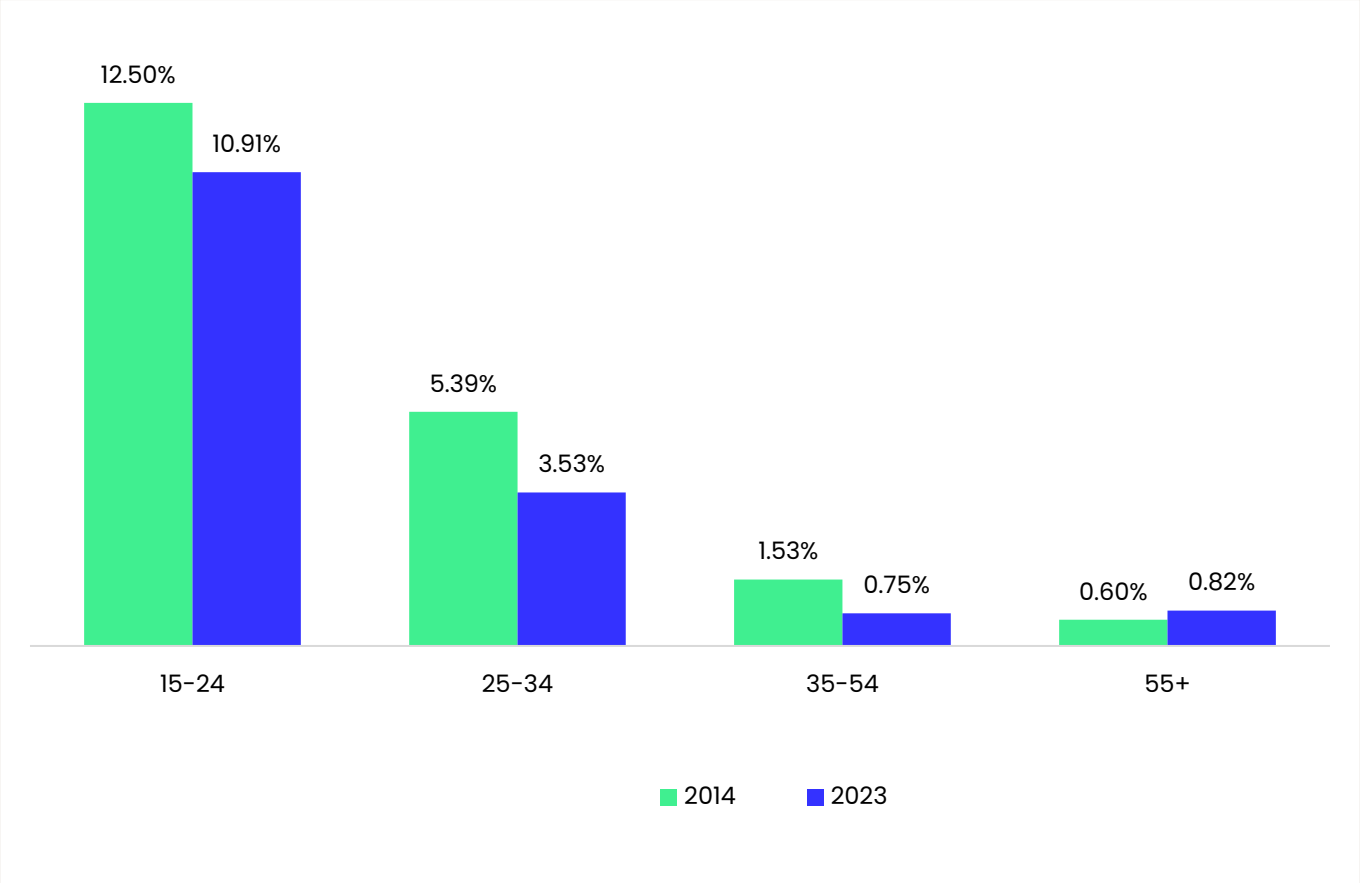
According to data from the national labour survey (Survei Angkatan Kerja Nasional, SAKERNAS), the unemployment rate across the 13 regencies decreased from 4.46% in 2014 to 3.19% in 2023. This was a significant improvement in overall labour market conditions for the region's workforce of more than 1.2 million people, albeit with some demographic groups experiencing persistently high unemployment. As shown in Figure 3.9 above, the employment rate varied by education level.

The educational composition of the labour force underwent a significant transformation between 2014 and 2023. The share of workers educated up to lower secondary school level declined from 65.31% in 2014 to 51.22% in 2023. At the same time, the share of those educated to upper secondary school level increased from 24.51% to 34.46%, while those with a tertiary education grew from 10.18% to 14.32%. This educational shift reflects broader regional development and, possibly, improved access to secondary and tertiary education.

The differences between the categories in Figure 3.9 indicate that educational attainment meaningfully influenced employment outcomes in nickel-producing regions. The fact that less educated workers experienced the lowest unemployment rates (2.32% in 2014, decreasing to 1.33% in 2023) likely reflects the predominantly informal nature of the region's economy, in which such workers readily find jobs in agriculture and other sectors with low barriers to entry. Unemployment among tertiary-educated workers was 4.02% in 2023, higher than the regional average of 3.19%. The relative lack of labour market opportunities for highly educated workers may stem from geographical barriers and mismatches between skills and job opportunities in the industries that dominate the region.

**Youth unemployment remains a persistent challenge in nickel-producing regions**, as shown in Figure 3.10 below. Workers aged 25-34 experienced the largest improvement in the employment rate, with those aged 35 and over experiencing the lowest absolute rate. These trends suggest that targeted policy measures are required to help young people overcome the difficulties they still face in entering the labour market despite broad economic development in the 13 regencies.

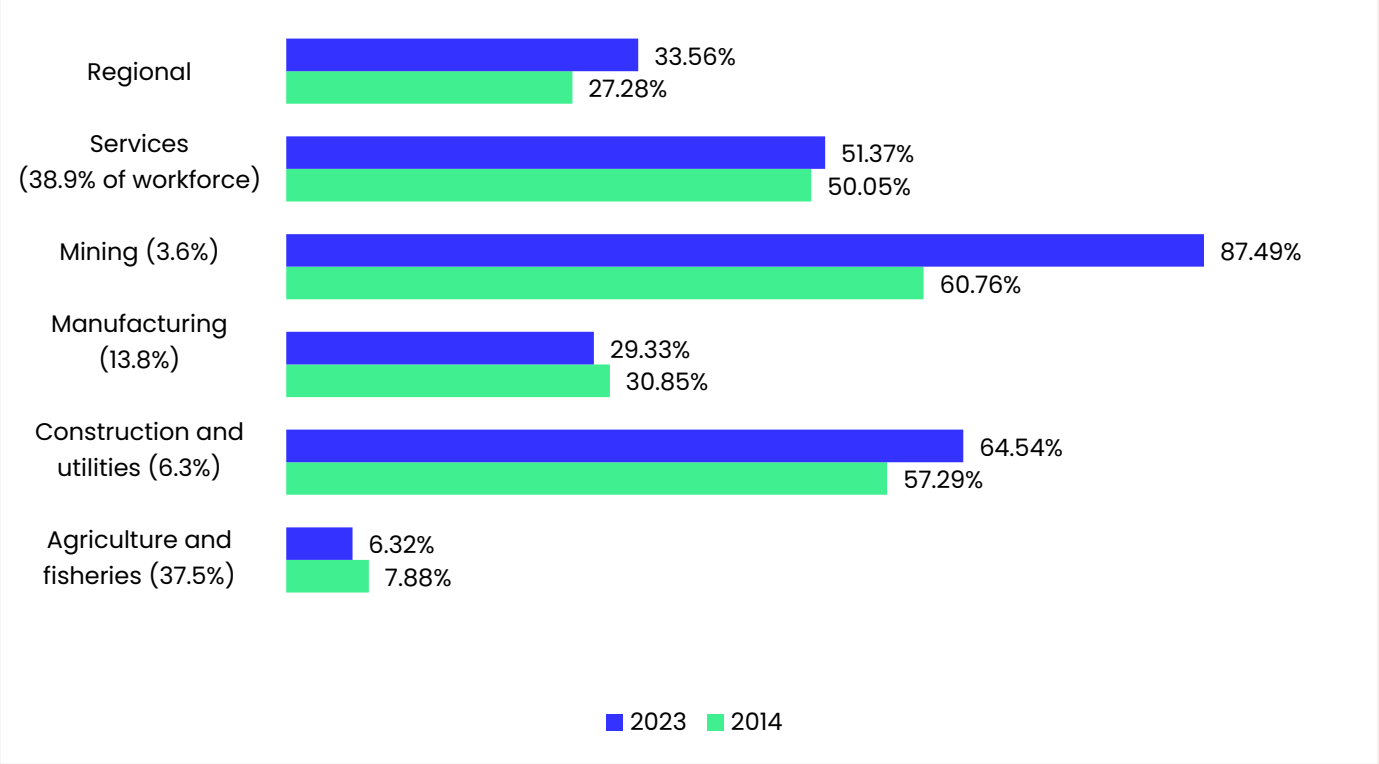
**Figure 3.10. Unemployment rate by age group, 2014 and 2023**




*Source: Authors' calculation based on SAKERNAS data for 2014 and 2023.*

**The economies of nickel-producing regions have undergone only modest formalisation overall**, as shown in Figure 3.11 below. In 2023, more than two-thirds of workers in the regions were in informal employment despite the broader improvements in the local employment market, suggesting that the benefits of the nickel sector's expansion had been relatively limited in this sense.

**Figure 3.11. Share of workers in formal employment, 2014 and 2023**




*Source: Authors' calculation based on SAKERNAS data for 2014 and 2023.*

**The formalisation of the economy has been strongest in mining and other sectors directly tied to the nickel industry**. In the mining and quarrying sector, formal employment surged from 60.76% in 2014 to 87.49% in 2023. This is now the most formalised sector in the 13 regencies. At the same time, the formalisation of construction and utilities, which are closely integrated into mining operations, increased from 57.29% to 64.54% during the same period. That is noteworthy because it demonstrates that employment growth in mining-related sectors has generated formal jobs rather than simply expanding informal work.

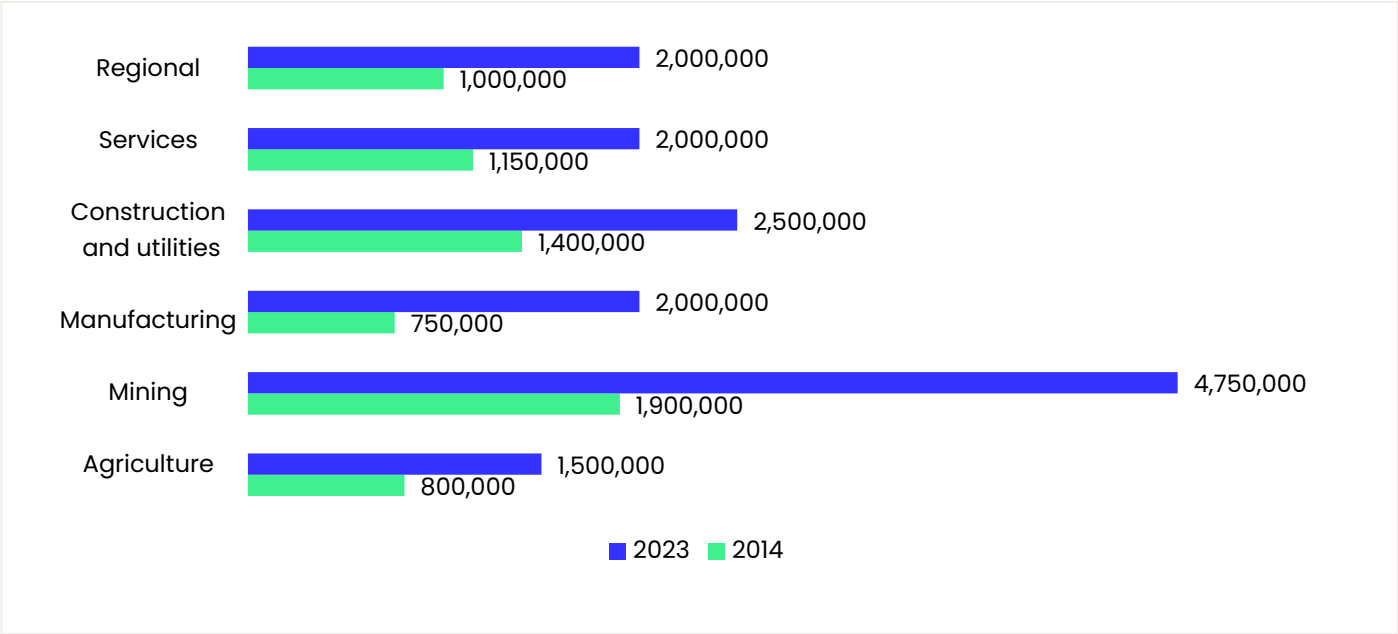
By comparison, formal employment in the manufacturing sector overall remained steady at 30.85% in 2014 and 29.33% in 2023. This aligns with the educational composition of the sector's workforce: in 2023, 57.51% of manufacturing workers were educated to lower secondary school level, compared to only 26.83% in the mining sector. The relationship between education levels and formalisation rates suggests that mining's high level of formalisation (87.49%) may be partly protected by higher skill requirements, which create barriers to entry for less educated workers. In other words, while mining has had a significant impact on formal employment, the resulting opportunities may remain relatively inaccessible to the less educated workers who dominate agriculture and informal services.

**Agriculture and services have undergone limited formalisation**. These two sectors together accounted for 76.34 per cent of total employment in 2023. Agriculture saw a slight decline in formal employment from 7.88% in 2014 to 6.32% in 2023, while services slightly increased from 50.05% to 51.37% in the same period. These divergent formalisation patterns indicate that improvements in employment quality have been concentrated in mining-related sectors rather than spread across the entire regional economy. Workers in the main employment categories for those who have lower education levels and lack access to mining-related jobs – agriculture, small-scale trade and informal services – have made little progress in gaining formal employment or securing employment protections. This indicates that

while the nickel boom has generated formal employment opportunities, few of its employment benefits have accrued to workers outside mining-related supply chains.

**Real wage growth has been modest in nickel-producing regions.** Median nominal wages in the 13 regencies more than doubled between 2014 and 2023. However, this amounted to a growth in real wages[2] of 40.84% in the period (see Figure 3.12). This indicates that increases in the cost of living absorbed most of the gains in nominal wages.

**Figure 3.12. Median wage by sector, 2014 and 2023**




*Source: Authors' calculation based on SAKERNAS data for 2014 and 2023.*

**Mining remained the highest-paid sector in nickel-producing regions between 2014 and 2013.** Construction and utilities, sectors closely linked to mining activities, offered the second-highest median wage at IDR 1.4 million in 2014 and IDR 2.5 million in 2023. While manufacturing workers experienced a significant increase in nominal wages, they remained among the lowest-paid in the region. As Figure 3.12 shows, their wages increased from IDR 0.75 million in 2014 (the lowest that year) to IDR 2.0 million in 2023 (only higher than agriculture, at IDR 1.5 million).

**Formalisation, coupled with a sectoral boom, led to a significant increase in the formal sector wage premium.** In nickel-producing regions, wages in the formal sector were approximately 55% higher than those in the informal sector in 2014 and 93.33% higher in 2023 (see Figure 3.12 above). Therefore, workers in the 13 regencies' mining sector gained an advantage due not only to greater job availability stemming from the nickel boom, increased formalisation and higher overall wage levels but also from the associated wage premium. A typical mining worker in 2023 was substantially more likely to be formally employed than their 2014 counterpart and, if formally employed, to earn higher wages than workers in other sectors. This mix of factors – employment availability, job quality and wage levels – positioned mining-related employment as the main beneficiary of regional economic growth (even if workforce migration dynamics could complicate this picture).[3]

## Hidden economic costs of the export ban

Overall, Indonesia's policy of restricting exports of raw nickel has created economic opportunities and generated additional government revenue. Yet while the government has supported the ban with a

[2] Real wage calculations use national inflation. Regional inflation in mining areas may differ, suggesting that real wage gains could be lower than reported here.

[3] For example, the expansion of the mining sector could improve employment metrics by attracting workers from other regions without significantly benefiting local workers, if the latter merely moved from one low-paying role to another in a different sector.

broad mix of fiscal and monetary policies to help maintain macroeconomic resilience amid adverse shocks, the policy has several hidden costs.

**Indonesia's ban on exports of raw nickel has created market distortions and economic inefficiencies.** As discussed, the country's economic planning has taken on a more explicitly developmentalist orientation in the past decade, with stronger state-led programmes aimed at industrialisation and inclusive growth (Warburton, 2018). However, there is evidence that export bans often create market distortions alongside their intended benefits. Some of these distortions relate to the fact that new entrants into iron- and steel-using industries tend to be smaller than incumbents, in line with challenges linked to barriers to entry and scaling in downstream production (Kee and Xie, 2025). Export bans can increase the domestic value-added ratio (the share of value that the national economy contributes to gross exports) of downstream activities such as automotive production by reducing the price of domestically sourced inputs, such as nickel and steel (ibid.; Kee and Tang, 2016). Yet these gains can have unintended efficiency costs: they risk shielding less productive firms and weakening companies' incentives to make productivity-enhancing investments (ibid.).

**The export ban is capital-intensive**. Such restrictions rarely produce downstream industrialisation gains without substantial front-loaded investment in refining capacity and the supporting infrastructure needed to operate it competitively, particularly reliable power, water-supply and logistics capacity (Bosker et al., 2025). This reallocation of capital has complex implications for productivity, partly because it can divert resources away from sectors that could otherwise generate higher productivity growth and have positive spillover effects on the broader economy. In other words, even if an export ban succeeds in shifting industrial activity downstream, the net welfare effect will depend on the degree to which it raises economy-wide productivity.

**The export ban also has public finance costs**. These relate to foregone revenues from the fiscal incentives the government offered to attract investment, as well as the indirect fiscal impact of reduced profitability and output among firms that were adversely affected by the restriction. Beyond foregone fiscal revenue, the export ban may have created negative externalities such as environmental degradation caused by mining and emission-intensive processing, given the rapid growth of captive coal power tied to Indonesia's nickel processing hubs in Central Sulawesi and North Maluku (Andrenelli et al., 2025; Hasan and Hummer, 2026). Following the export ban, mining firms that previously focused on exporting ore needed to realign their operations or invest in refining capacity, creating adjustment costs. Moreover, smelter construction is time-consuming and faces both technological barriers and financial constraints (Kee and Xie, 2025).

**The export ban depletes resources and could create long-term vulnerabilities.** Given that mineral resources are finite, overreliance on resource-led growth during boom periods requires a clear strategy to deal with downturns. Indonesia does not yet seem to have a clear, rules-based mechanism for saving and smoothing nickel windfalls over the resource cycle, such as the kind of local investment fund to manage resource rents, commodity volatility and reserve depletion that some policy experts have suggested (LPEM, 2025). Moreover, while Indonesia's industrial policy for critical minerals and EVs has had early success, there are growing challenges to its long-term viability (Walker and Palaon, 2025). A sustainable approach to mining involves extracting resources while limiting environmental degradation and reducing future economic exposure as reserves decline. This underscores the importance of building resilience through investments that outlast the resource cycle, particularly human capital and environmental protection. Strengthening skills, institutions and environmental safeguards can help translate temporary commodity windfalls into durable development outcomes.

# 4. Environmental and social trade-offs

This section explains how nickel mining and processing have caused significant environmental degradation and adversely affected communities in Indonesia, as in other countries engaged in the large-scale extraction of minerals critical to the net zero transition. It is important to account for these trade-offs in the design of government economic policies and strategies.

## Deforestation, pollution and biodiversity

In 2007–22,[4] companies extracting nickel in Indonesia cleared more than 75,000 hectares of forest, much of which had large carbon stocks and a high concentration of biodiversity (Brown and Harris, 2024). According to radar data, the rate of deforestation appeared to be accelerating: these firms cleared more than twice as much forest in 2023 as in 2020 (ibid.) This deforestation has endangered local species by damaging their habitats. One study found that on Peleng Island – the site of several nickel mines – some of the 16 species of birds endemic to Sulawesi were near threatened (KOMIU , 2025). This is particularly concerning due to these species' role in facilitating ecosystem processes such as pollination and the dispersion of seeds (Lee et al., 2007).

At one nickel mining site in Raja Ampat, Papua, sediment runoff affected nearby marine ecosystems, including through coral burial and bleaching. Heavy rainfall caused tailings in waste ponds to flow into coastal waters. Raja Ampat lies within the UNESCO Geopark area and the Coral Triangle – which, as one of the world's most biodiverse marine regions, is home to species such as endangered turtles and manta rays (Earth Insight, 2025). In June 2025, the government responded by revoking several mining licences in the area. While it has since reissued some licences, subsequent reviews heightened auditing requirements and administrative sanctions for some operators (Muliawati, 2026).

Indonesia's nickel-mining sites are concentrated in the rural areas of Central Sulawesi, Southeast Sulawesi and North Maluku, meaning that they have limited access to the national power grid and other infrastructure. The rise of the nickel industry and associated industrial parks has created a surge in energy demand to accommodate processing needs. Consequently, most nickel industrial parks rely on coal-fired captive power plants for their electricity supply (Zhengyun and Wei, 2025). Indeed, 80% of Indonesia's captive coal capacity was built after 2014, with much of this growth concentrated in North Maluku and Sulawesi (Zhu et al., 2023). This poses environmental challenges, as smelters and captive power plants in Central Sulawesi, Southeast Sulawesi and North Maluku are projected to exceed the World Health Organisation's air-quality limits by 2030 (LPEM, 2025).

Smelting operations have contaminated rivers, degrading water quality and disrupting ecosystems (CREA & CELIOS, 2024). Tailings disposal from nickel processing has polluted watersheds, including rivers, within these regions. This not only poses a threat to local fish species but also creates health and food-security risks for people. Furthermore, the contamination of ecosystems has forced some fish to migrate away from their original habitats (Nasution et al., 2024). These effects of mining activities in environmentally sensitive areas underscore the importance of assessing the long-term trade-offs of industrial policy and introducing strong monitoring and compliance mechanisms to manage biodiversity risks.

## Social impact

The rapid development of mining activity in Indonesia has contributed to a rise in agrarian conflicts (LPEM, 2025). In nickel-mining areas, these conflicts relate to land ownership and land transfers. Local communities, especially those in rural areas, often lack official documentation of their land ownership

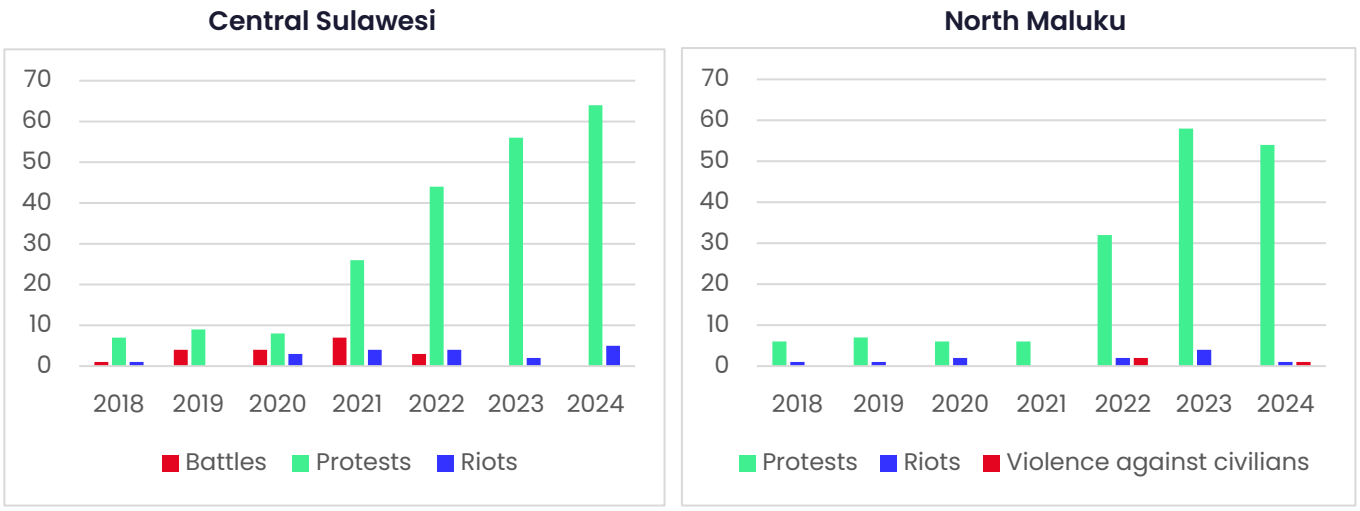
[4] The years measured in this literature start form the latest license award or adjustment which vary between 329 mines that assessed in this report, the earliest license is dated from 2007.

status. This limits their legal capacity when investors and government organisations repurpose their land as part of a national strategic project such as Indonesia's shift towards downstream nickel production. The Indonesian government issued Presidential Decree No. 109 (2020) to designate nickel-processing facilities and industrial parks as part of a national strategic project, aiming to facilitate large-scale investment and to provide state support in the resolution of land-acquisition disputes. Subsequent land grabs infringed on indigenous communities' rights by displacing them without consent (LPEM, 2025).

One local NGO that explored rising social conflict between factions of a local community found that those in favour of mining received compensation and promises of employment in return for their land (KOMIU, 2025). Meanwhile, the company that purchased the land used a compensation plan that excluded some members of the community who opposed mining out of concern about its environmental impact.

Broader social tensions can be observed in data from the ACLED Conflict Index, which covers political violence in more than 240 countries and territories. Indonesia ranks in 40th place in the index, classifying it as a turbulent country. While disputes related to nickel production are only a small part of this, they can contribute to social fragmentation in an environment where there is already significant tension between the government and local communities (see Figure 4.1).

**Figure 4.1. Total number of conflicts recorded by the ACLED Conflict Index, 2018–24**




*Source: Authors' calculation based on the ACLED dataset.*

As rural areas developed into mining sites, urbanisation and the influx of both foreign and non-local domestic workers created complex social dynamics. One study found that IMIP mining operations led to changes in the social fabric in Bahodopi, part of the nickel district in Morowali (Hudayana et al., 2020). Previously an isolated area of Central Sulawesi with a largely indigenous population, Bahodopi became more heavily populated as these operations brought in migrants from Java and foreign countries (ibid.).

There have also been concerns regarding occupational health and safety practices at Indonesia's nickel-processing facilities. According to the non-profit organisation Trend Asia, 114 incidents ranging from heavy machinery accidents to furnace explosions resulted in 101 deaths and 240 injuries at these facilities between 2015 and 2024 (Lakshmi and Mariska, 2024). Workers cited inadequate protective equipment and communication barriers between Indonesian and Chinese staff as factors contributing to unsafe working conditions. A few of the incidents involved conflicts between social groups, including two clashes between foreign and Indonesian migrant workers (Fikri, 2017; Saputra and Alfarizi, 2023).

Local communities in mining areas in Central Sulawesi primarily relied on subsistence farming, hunting and fishing. Despite low unemployment levels in the region, many local residents whose daily lives focused on agriculture and fishing were unable to take jobs in the mining sector. Because they lacked the skills required to work in the industry, the nickel boom in the region presented them with more

challenges than opportunities. In coastal areas, the environmental impact of nickel mining on water quality has threatened fishing practices. For example, some workers in the fishing industry have reported that damage to coral reefs close to shore has forced them to travel further out to sea, causing them to incur higher fuel costs and reducing their income. Farmers report that mining waste has flowed into their paddy fields via rivers (Kurniawan et al., 2025). More broadly, air pollution from mining has been linked to a higher incidence of respiratory illnesses in some areas (Nasution et al., 2024).

The government has taken action to uphold environmental and social safeguards. In September 2025, it revoked the permits of 190 mining companies, 36 of which were nickel producers, in response to environmental violations (Reuters, 2025). The government has also partnered with mining companies and universities in small-scale efforts to restore coral reefs and seagrass, replant mangroves and regularly monitor habitats in parts of Central Sulawesi and North Maluku (Laoli, 2024; Sari, 2024).

The social and environmental impacts of nickel mining and processing have reverberated through international investments and supply chains. In September 2025, Norway's sovereign wealth fund excluded Eramet from its portfolio over the firm's involvement in Indonesian nickel production, citing human rights violations and environmental degradation (Agence France-Presse [AFP], 2025). In 2024, BASF and Eramet pulled out of a US$2.6 billion nickel-and-cobalt refinery project. While they attributed this to conditions in the global nickel market, some observers believe that the risks of weak environmental, social and governance (ESG) compliance played a role in the decision (BASF, 2024; Hutt, 2024). These risks are especially acute given that the US Department of Labor has designated Indonesian nickel as having been produced with forced labour, and that the upcoming implementation of the EU Battery Passport will heighten due diligence requirements in the industry (Rachman, 2024).

Development models based on the exploitation of natural resources tend to focus on short-term economic gains without considering ecosystem sustainability. When natural resources are depleted or damaged, communities lack alternative economic resources and become vulnerable to structural poverty (Edwards et al., 2014). Therefore, improving education quality and health services in nickel-producing areas will be crucial to supporting community welfare in the long run. More broadly, it will be vital to design economic policies that simultaneously strengthen environmental safeguards and improve labour and community outcomes, aligning industrial policy with long-term investment in human capital and capability to reduce inequality while achieving sustainability goals.

# 5. Conclusion

Overall, the evidence reviewed in this report suggests that Indonesia's ban on exports of raw nickel has had several macroeconomic and regional benefits. At the same time, the significant trade-offs in the nickel boom will need to be incorporated into Indonesia's long-term growth strategy. Lessons from the Indonesian experience can inform the policies of other EMDE governments.

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Nickel-producing regions such as North Maluku and Central Sulawesi have experienced stronger GDP growth and an expansion of employment opportunities, with improvements in job quality and wages. The shift towards exports of higher-value nickel products has helped sustain a trade surplus, as well as higher government revenues at both the national and subnational levels. Importantly, the export ban's near-term success has not occurred in isolation: it has been reinforced by a broader mix of supportive conditions and complementary policies, including those focused on macroeconomic stability, fiscal measures and an investment environment shaped by both domestic priorities and foreign capital.

However, increased mining and processing activity has intensified the risk of environmental degradation through pollution, deforestation and biodiversity loss, and has had an adverse impact on local communities. Indonesia also faces a more complex set of challenges than it did during the boom. Nickel prices have declined due to global oversupply, rising competition, uncertainty related to developments in battery chemistry, and the evolving dynamics of key investment partners and export markets. These trends highlight a central vulnerability of resource-led strategies: short-term gains can temporarily mask longer-term risks if the economy becomes overly dependent on a single commodity, production hub or trade partner.

The main policy challenge is in how to sustain growth following a commodity boom while remaining on a sustainable development pathway. For Indonesia and other emerging markets and developing economies (EMDEs) that are navigating similar transitions, economic policy and climate policy are deeply interconnected. With many EMDEs simultaneously pursuing rapid growth, managing climate risks and confronting significant financial challenges, Indonesia's experience shows that export restrictions can create space for industrial development and fiscal gains. However, sustaining these benefits requires strong governance, credible environmental safeguards and deliberate planning for technological developments and market shifts. It also underscores the important lesson that different minerals, places and institutional contexts require different approaches.

**Looking ahead, this report provides several insights to policymakers in EMDEs with abundant natural resources who are considering similar export restriction policies.** In particular, it highlights the following priority areas for further policy discussion and research:

- Revenue management during resource booms. The ways in which windfall revenues are saved, invested and redistributed should support long-term productivity and resilience.
- Industrial policy design and state intervention. There needs to be an appropriate balance between market signals and state direction in production, exports and downstream integration.
- Environmental safeguards and decarbonisation of the value chain. There is a demand for cleaner energy sources for minerals processing, more effective waste management, land rehabilitation, and clearer environmental standards for mining operations.
- Labour and community outcomes. Worker mobility, local hiring, training and the management of foreign labour are important mechanisms to strengthen community participation and share the benefits of industrial development more widely.

- **Development beyond GDP.** Downstream industrial development should align with broader investment in human capital and capability, initiatives to empower local communities and reduce inequality, and efforts to achieve environmental sustainability goals.

Indonesia's ban on exports of raw nickel appears to have produced meaningful economic gains and accelerated downstream investment. Yet, in a rapidly changing global landscape, the policy's long-term success will depend on whether the country can manage environmental and social trade-offs, reduce its vulnerabilities and build a more sustainable growth model. Given Indonesia's distinctive governance and institutional context, its experience offers useful lessons to policymakers in other countries who are assessing whether export restrictions on critical minerals can be an effective instrument in fiscal and economic policy for a low-carbon transition.

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