Nickel mining in Obi Island: problem or solution for mitigating climate change effects?

Ignatius Agung Satyawan 1*, Togu Marisi Pardede 2, Muhammad Sultan Kevin 3

1Department of International Relations and ASEAN Study Center, Universitas Sebelas Maret, Surakarta, Indonesia
2Department of International Relations, Universitas Sebelas Maret, Surakarta, Indonesia
3Department of International Relations, Universitas Sebelas Maret, Surakarta, Indonesia

Abstract. Climate change has become a global issue that threatens human life. According to Intergovernmental Panel on Climate Change (IPCC), since 1850 there has been an increase in temperature and sea level so that small islands will sink. As the largest archipelagic country in the world, Indonesia is committed to reduce carbon emissions as a means for mitigating the effects of climate change. The current program is to replace fossil energy with renewable energy. Nickel is a mineral for basic materials to make batteries that can be used as an energy source for electric vehicles which are environmentally friendly. Indonesia has the world's largest nickel reserves and contributes to 37% of the world's total nickel production in 2021. One of the areas that produces nickel is Obi Island in North Maluku. Massive nickel production in this island has negative on environment as well as social-economic on local community. The purpose of this study is to analyse the profit and loss impact of nickel mining in Obi Island. Using qualitative descriptive method through library research this study shows that nickel mining is able to increase regional income but is accompanied by environmental degradation and increased social problems for the local people.

1 Introduction

Global warming and climate are the biggest challenges facing the world today. The impacts have been felt all over the planet, starting from rising global temperatures, extreme weather that is increasingly occurring, to ecological changes that affect human life and the earth's ecosystem. One of the main causes of climate change is the emission of greenhouse gases, and the energy sector is the main source of these emissions. Therefore, many countries, including Indonesia, have committed to reduce greenhouse gas emissions and tackle climate change.

Indonesia, as a country with a large population and rapidly growing economy, has an important role to play in the global effort to address climate change. The Minister of Environment and Forestry, Dr Siti Nurbaya signed the Paris Agreement on Climate Change on 22 April 2016. The Paris Agreement is a monumental global agreement to

* Corresponding author: agungsatyawan@staff.uns.ac.id
combat climate change. National commitment is demonstrated through the Nationally Determined Contribution (NDC) for the 2020-2030 period, as well as actions before 2020. In addition, the Paris Agreement has been supported by 195 countries.

One of the efforts made by Indonesia to fulfil its Paris Agreement commitments is to introduce electric vehicles as an alternative to fossil fuel vehicles. However, in the development of electric vehicle batteries, the raw material for making them is nickel. Indonesia, as the owner of the largest nickel reserves in the world, certainly has an important role in making the transition from conventional vehicle energy to electric fuelled vehicles. Based on data collected from the Ministry of Energy and Mineral Resources, it is recorded that Indonesia has 52% of the world's nickel reserves with a total of 72 million tons [1]. By realizing this advantage, the Indonesian government issued a downstream policy as an effort to increase the selling value of nickel.

One of the locations that has the largest nickel reserves is on Obi Island in North Maluku Province. Obi Industrial Estate has been designated as a national strategic project based on Presidential Regulation Number 109, 2020. Harita Nickel, one of the largest nickel mining companies in the world, manages a nickel mine on Obi Island. This article analyses the positive and negative impacts of Nickel mining on Obi Island.

Below is the figure example of Obi Island:

![Fig.1. Obi Island][2]

## 2 Discussion

As a result of the downstream policy by the Indonesian government for nickel mining products, the construction of smelters is important because of their use to process nickel into content that has added value. However, of course this nickel processing has both positive and negative impacts.

### 2.1 Positive impacts

The positive impact of nickel mining and processing is employment. The quite massive addition to the workforce is employment in the mining and industrial sector. This occurs in line with the increasing number of smelters operating and the number will continue to increase until the end of the year to process raw nickel ore in North Maluku, as well as the increasing number of contract workers/laborers to accelerate the construction of new smelters for 2022 and the following year. President Joko Widodo claims that before downstream, there were only 500. After downstream mining workers in North Maluku has increased to 46,500 workers.

Apart from absorbing labor, the presence of nickel processing plants and its smelters provides state revenue from taxes. President Joko Widodo revealed that the value of nickel exports before downstream was only IDR 30 trillion, but as a result of downstream the value of nickel exports increased to IDR 510 trillion. Tax revenues from the nickel downstream sector are of course increasing. In 2022 alone state revenue will reach IDR 17.96 trillion [3]. This revenue has increased 10.8 times compared to 2016.
which was only IDR 1.66 trillion. Meanwhile, corporate income tax revenue in 2022 was recorded at IDR 7.36 trillion or an increase of 21.6 times compared to 2016 which was only IDR 0.34 trillion [3].

2.2 Negative impacts

Before nickel smelter company existed, Obi Island's air quality was relatively good. Local residents can breathe easily and cases of severe respiratory illness are rare. However, after the establishment of a nickel smelter company, emissions of toxic gases such as sulfur dioxide (SO2) and nitrogen oxides (NOx) have increased significantly. Nickel smelters produce these dangerous gases during the process of smelting nickel ore at high temperatures. Over time, the impact of this air pollution has become more pronounced, with residents experiencing respiratory problems such as asthma, bronchitis and throat irritation more frequently. The increase in cases of respiratory diseases also increases the public health burden, including increasing medical costs [4].

Nickel smelter industry requires large amounts of water for processing and cooling purposes. Before the nickel smelter company existed, Obi Island's aquatic ecosystem functioned well. However, after the establishment of the smelter company, liquid waste containing toxic chemicals, such as heavy metals and hazardous compounds, was discharged into the surrounding waters [5]. The presence of nickel smelter processing companies produces toxic waste which pollutes the waters around the island. This waste pollutes sea water and has a direct impact on marine biota, including skipjack tuna. This pollution threatens the survival of skipjack tuna and makes it unfit for export. Thus, the economy of local fishermen who rely on catching skipjack tuna suffered heavy losses. Agriculture is the backbone of the economy and the main livelihood for the people of Obi Island. Before the establishment of the nickel smelter company, crop yields were quite stable and people could rely on agriculture as a source of income. However, with soil and water pollution by nickel smelter waste, crop yields have decreased significantly. Worsening soil quality and contaminated water result in decreased quality of crop yields. Farmers face difficulties in maintaining local food security, and dependence on outside resources for basic food is increasing.

The Indonesian government has an ambitious target to green cities by achieving zero emissions in electric vehicles. However, on the other hand, pollution of the marine environment by nickel smelter waste contradicts these efforts. Ironically, the government is promoting a clean environment on land while destroying the marine ecosystem which is so important to the people of Obi Island [6].

The existence of nickel smelter companies has created complex social conflicts between local residents and mining companies. The 'Harika' Nickel Company is also privileged because it has the status of a vital state object, making it exclusive and untouchable [7]. As a result, the Indonesian government strictly protects this island with the presence of army personnel. This hampers access to transparency for the public and journalists who want to investigate the impact of nickel smelter companies. This limited information makes it difficult for the public to fully understand the negative impacts caused by these companies.

The establishment of the nickel smelter company has brought major changes to the urban planning and lifestyle of the people of Obi Island. Massive industrial facilities and urbanization have changed the face of the island permanently. This has threatened the island's cultural heritage, including its unique local traditions, language and culture. As the industry grows, many elements of local culture are marginalized or even forgotten, threatening the sustainability of cultural heritage that has existed for centuries. The fact that 21 of the 23 nickel smelters in Indonesia are owned by Chinese companies is a serious problem. This illustrates China's dominance in the Indonesian nickel industry, including its mines. Regulations such as the President Law on nickel exports and plans to downstream the nickel industry are becoming less relevant because most of these assets are owned by foreigners. This has an impact on state control of Indonesia's natural resources and increases the risk of unsustainable exploitation [8].
2.3 The way out

Nickel is the main raw material for lithium batteries as an energy source for electric vehicles, which is very important for fulfilling Indonesia's commitment to reducing carbon emissions. Therefore, currently nickel is a very strategic mining material and automatically invites investors to invest so that nickel becomes a mining material that has high economic value. However, nickel mining and its processing has an impact on environmental damage and causes social, economic and cultural problems for communities living around the mine. Therefore, enforcing legal regulations is an absolute requirement to achieve maximum use value of nickel while reducing negative risks to downstream nickel mining.

3 Conclusion

Processing and mining of nickel commodities on Obi Island can indeed have a positive impact on society, such as opening up employment opportunities, income from the tax sector, resulting in an increase in the economy in North Maluku. The construction of a nickel factory and smelter on Obi Island is also an effort to support the downstream of nickel processed products such as electric vehicle batteries which will later become a government initiative in converting gasoline-fueled vehicles into electric fuel. This is a commitment to fulfill Indonesia's agreement and concern for the environment. However, to fulfill this commitment, Indonesia has to sacrifice the environment on Obi Island. Behind the government's mission to realize the mission of zero vehicle emissions in urban areas, in fact there are various kinds of environmental exploitation violations on Obi Island which are of course caused by the Nickel company's neglect of environmental safety. This can be seen from the pollution of drinking water due to factory waste, the worsening air quality for breathing, and the decline in the quality of fish caught by fishermen due to sea water pollution. The only way to overcome this is to enforce and regulate the law in a transparent and just manner.

References

1. www.esdm.go.id/id/booklet/booklet-tambang-nikel-2020
3. Mediatama, Grahanusa, Kontan.co.id, 13 Aug. 2023
4. https://www.mongabay.co.id/2023/05/30/munculkan-banyak-masalah-nikel-indonesia-untuk-siapa/
5. S. Yudo and T. Hernaningsih, Kondisi kualitas dan kebutuhan air Desa Kawasi di kawasan pertambangan nikel Pulau Obi, Jurnal Rekayasa Lingkungan, 14, 1 (2021), 1–13
6. T. Sudinda, Analisa potensi sumber daya air Pulau Obi Halmahera, Jurnal Rekayasa Lingkungan, 13, 2 (2021), 166–81