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Alliance of Independent Journalist

TRACTION ENERGY ASIA

BEHIND THE MASK OF ENERGY TRANSITION

An Anthology of Journalistic Works by Participants of the Third Cohort of the Environmental-Economic Journalism Academy (AJEL)

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This compilation book is one of the outcomes of the 3rd year of the Environmental-Economic Journalism Academy (AJEL), organized by AJI Indonesia in collaboration with Traction Energy Asia.

The book is published by AJI Indonesia with funding support from Traction Energy Asia.

First published in July 2025

Foreword From AJI Indonesia

Reporting Energy, Voicing Inequality

Energy transition in Indonesia is often hailed as a solution for the future, but reality tells a different story. The government's pledge to reach net zero emissions by 2060 may sound ambitious, yet behind the promises of “green energy," the implementation on the ground is riddled with contradictions and inequality.

Instead of reducing reliance on coal, new coal-fired power plants (PLTU) are still being approved until 2030, justified under the term “gradual transition."

Co-firing Program, which mixes coal with biomass such as wood or waste, is promoted as a stopgap solution. However, in West Java, its reliance on wood raises deforestation concerns, while in Southeast Sulawesi, waste-based co-firing faces challenges like poor infrastructure, weak oversight, and negative impacts on scavengers and public health.

What should have been an inclusive and just transition is instead producing new victims. Hydropower projects in Kalimantan and Sulawesi, often branded as clean energy, are built on Indigenous lands without consent, displacing communities, destroying forests, and triggering land conflicts. A transition without social justice becomes another form of dispossession.

In this context, journalism plays a vital role in holding power to account. Our task goes beyond reporting government data and pledges, we must follow the money, ask who benefits, and expose who pays the price. Journalism must amplify marginalized voices, uncover greenwashing, and demand transparency in every energy project.

Some media outlets have shown how energy reporting can become a powerful tool for advocacy, exposing mismanaged solar projects or megadams that violate Indigenous rights. These stories are urgent and essential to ensure that the transition doesn't become an elite project that forgets the people.

Still, this path is not without risk. Journalists uncovering corruption in energy projects face threats, from political pressure and corporate

intimidation to digital attacks by online buzzers. But it is in this space that journalism finds its true value: revealing truth amid the noise of propaganda.

Energy transition is not just about switching energy sources, it's about transforming our relationship with nature and each other. If hijacked by political and economic interests, it risks becoming yet another cycle of injustice.

This book features 21 stories by journalists from East Kalimantan, West Kalimantan, and Southeast Sulawesi, regions often overlooked, yet on the frontlines of Indonesia's energy transition. Their work captures the complexity, contradictions, and the remaining hope in this ongoing process.

We thank Traction Energy Asia and all partners who helped make this book possible. May it inform, inspire, and urge journalists to stay critical, pursue justice, and keep voicing the unheard.

Nany Afrida
President of AJI Indonesia

June 2025

Foreword from Traction Energy Asia

Energy transition should pave the way toward a more just and sustainable future. Yet in practice, Indonesia's transition often falls into the trap of business-as-usual, replacing one form of extraction with another, without addressing the root causes of social inequality and ecological crisis.

This book is the outcome of a learning and critical reporting process by journalists who took part in the third cycle of the Environmental-Economic Journalism Academy (AJEL). AJEL is a collaborative initiative with the Alliance of Independent Journalists (AJI) Indonesia, aimed at strengthening journalists' capacity to report on energy, economy, and environment through the lens of social justice, transparency, and accountability.

The stories in this book show how Indonesia's energy transition narrative still falls short of justice. Behind the promises of emission reduction lie land grabs, the neglect of Indigenous and local rights, and in many cases, new forms of ecological harm instead of environmental recovery.

At Traction Energy Asia, we believe strong, independent journalism plays a strategic role in driving policy change and building public awareness. We extend our deepest appreciation to all AJEL participants, mentors, editors, and the AJI Indonesia team who made this publication possible.

We hope these stories serve not only as a reflection of the current landscape, but also as fuel for discussion, advocacy, and real change toward a just and inclusive energy transition

Tommy Pratama
Executive Director - Traction Energy Asia

June 2025

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Nickel's Curse and Sand Mining in Konawe: A Livelihood Shattered

by Muhammad Sulhijah

Activities of PT Virtue Dragon Nickel Industry (VDNI) in the Morosi Industrial Area, Konawe, Southeast Sulawesi. (Photo by WALHI Southeast Sulawesi for Sultrademo.co)

The future and sustainability of the Konaweha River ecosystem are increasingly under threat. The presence of nickel smelter company PT Virtue Dragon Nickel Industry (VDNI) in Morosi District, Konawe Regency, along with rampant illegal sand mining, has triggered environmental pollution and degradation that jeopardize the community's livelihoods.

This concern is not unfounded. A 2019 study by Makassar State University (UNM) analyzing the Pollution Index (PI) of the Konaweha River due to nickel mining activities in Konawe, Southeast Sulawesi, revealed that the river's water quality was at a moderate pollution level, both in residential areas and near the PT VDNI industrial zone.

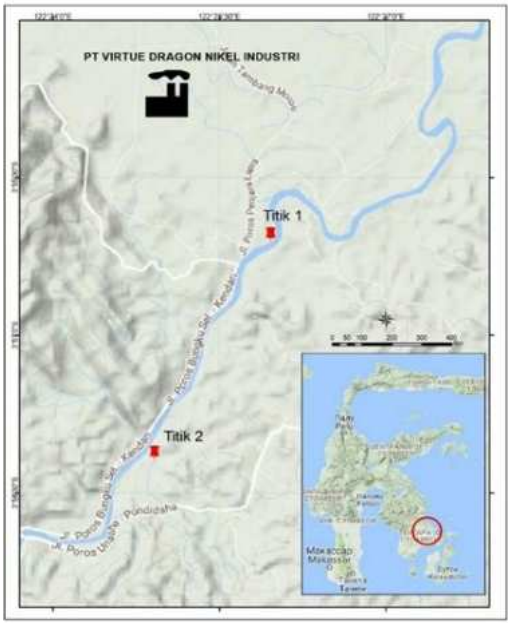

Image of the PT VDNI site in Morosi District, Konawe Regency, Southeast Sulawesi.

Several physico-chemical parameters of the river water exceed the permissible limits, making it highly unsuitable as a source of drinking water. This is due to the high level of water consumption in the nickel mining area, which increases the risk of heavy metal accumulation in animals.

Location	Pollution Index	INDEX VALUE CRITERIA				STATUS
		0 ≤ Plj ≤ 1.0	1.0 < Plj ≤ 5.0	5.0 < Plj ≤ 10.0	Plj > 10.0	
1	7.20	-	-	√	-	Moderately Polluted
2	5.40	-	-	√	-	Moderately Polluted

Source: Data Analysis Results

Nickel smelter activities also pose a risk of contaminating productive aquifer zones, which provide abundant groundwater used for household needs. According to Andi Rahman, Director of the Southeast Sulawesi chapter of the Indonesian Forum for the Environment (WALHI), field analysis has revealed numerous serious environmental issues, especially related to river ecosystem pollution.

WALHI's 2023 laboratory tests detected heavy metals such as copper (Cu) and cadmium (Cd) in the Konaweha and Motui rivers, as well as in fishponds that rely on these rivers as a water source.

"The presence of these heavy metals has disrupted aquatic ecosystems, reducing populations of fish, shellfish, and other organisms," Andi said.

He added that nickel processing activities by PT Virtue Dragon Nickel Industry (VDNI) and PT Obsidian Stainless Steel (OSS), along with emissions from the local coal-fired power plant (PLTU), have led to severe river pollution. This environmental degradation not only threatens the survival of river habitats but also directly affects communities who rely on the rivers for water and livelihood.

"Fish and shellfish production, which used to be abundant, has dropped drastically in both quantity and quality. Communities that once harvested large amounts of shellfish are now seeing a significant decline in productivity," he explained.

Ironically, despite the river's polluted state, the water is still being treated and distributed as drinking water by the Kendari municipal water utility, PDAM Tirta Anoa.

"This practice poses a serious health risk to people who depend on this water for daily use," Andi warned.

Meanwhile, PT VDNI's public relations officer, Bahar, declined to comment when asked about the environmental impact findings related to the company's operations. He simply responded, "I can't. There's nothing to talk about."

Illegal sand mining along the riverbanks has further worsened the situation. Rahmad Sanusi, spokesperson for the Kendari-based River Basin Agency (BWS) Sulawesi IV, stated that these unregulated sand mining activities along the Konaweha River have led to environmental damage, including severe riverbank erosion.

"That's why we no longer issue technical recommendations (*rekomtek*) for sand mining operations," Rahmad said.

However, he declined to specify how many sand miners are currently active along the river. "Most of their permits or technical recommendations have already expired," he added.

The eroded banks of the Konaweha River, caused by illegal sand mining activities in Pusangi Village, Anggalomoare District, Konawe Regency. (Photo by Muhammad Sulhijah)

All sand mining activities in the Konaweha River area are still considered illegal, said Rahmad, as the operators have yet to obtain official permits. Many parties mistakenly believe that a technical recommendation from the River Basin Agency (BWS)[1] constitutes a permit. In fact, a technical recommendation only serves as a technical assessment. Through this document, BWS states that the river location is technically suitable for sand extraction.

However, Rahmad emphasized that, in principle, all mining activities must have a valid permit and be supported by an environmental impact assessment document. This requirement applies to all categories of mining operations.

"This document is a prerequisite before any mining activity proceeds to the Environmental Impact Assessment (AMDAL) phase," Rahmad said.

He explained that the process of issuing a technical recommendation takes a maximum of 14 days once all administrative requirements are fulfilled. It includes various technical studies used as the basis for assessing feasibility.

As for law enforcement related to water resource violations, the authority currently lies with BWS. According to Rahmad, his team continues to monitor the field and has issued numerous warnings to illegal sand miners.

1 Balai Wilayah Sungai (BWS) is a technical implementing unit under the Ministry of Public Works and Housing of Indonesia, responsible for managing water resources within a river basin area.

"In fact, several cases have reached the investigation report (BAP) stage, but none have yet progressed to the P21 stage (when the case file is deemed complete for prosecution)," he explained.

Pokea: A Source of Livelihood for the People

The environmental impact has directly affected the livelihoods of local communities. Rahim (50), a resident of Tabanggele Village in Anggalomoare District, Konawe Regency, is a fisherman who has been harvesting *pokea* clams (also known as kijing)[2]. He expressed concern over the drastic decline in his catch since sand mining began in the area.

"Since the sand processing started, it's become very difficult to find pokea," he lamented. "When they dredge the sand, the pokea get sucked in too."

Rahim has been a pokea fisherman for over a decade. Every morning around 9 a.m. Central Indonesia Time (WITA), he heads into the river with simple diving equipment. He stays underwater until midday, depending on the tide conditions.

Fishermen diving in the Konaweha River to collect pokea clams. (Photo by Muhammad Sulhijah)

Pokea, the Lifeline of River Communities

For Rahim, collecting pokea clams has long been the main source of income to support his family's daily needs and fund the education of his

2 Pokea is a freshwater clam (*Batissa violacea var. celebensis*) found in Southeast Sulawesi rivers, providing a key livelihood for riverine communities.

four children, his eldest has even graduated from university. However, sedimentation and the increasingly murky river water caused by sand mining have damaged the pokea habitat. As a result, Rahim and fellow fishermen are now forced to search for new spots untouched by mining operations.

"We look for places where the sand hasn't been dredged yet," Rahim said, pointing to several locations where he dives.

Beyond environmental damage, they also face limitations in equipment and lack of government attention. Rahim's boat is old and worn out. And government aid? "Almost none," he added.

Nasrudin Lapuo, another fisherman from Rumbia Village, Bondoala District, shared a similar complaint. He noted the sharp decline in pokea availability. "Back then, all it took was a short dive, and we could fill sackfuls," he recalled. "Now? If you're lucky, maybe fifteen liters."

The changes are not just in quantity, but also in price. According to the 59-year-old, *pokea* used to be almost worthless. Small ones couldn't be sold, and even the large ones fetched only fifteen thousand rupiah per liter. Now, due to scarcity, prices have doubled: large *pokea* sell for thirty thousand rupiah per liter, and small ones for twenty thousand.

Nasrudin pointed directly to sand mining as the major culprit behind the population crash.

"When there's sand mining, there's no *pokea*," he said firmly. "They suck up the sand, and with it, the entire habitat."

In the same area, another *pokea* fisherman, Kudirman, emphasized the uniqueness of *pokea* harvesting, it isn't seasonal. "You can dive any time," he said. "It all depends on fortune."

He too lamented the population decline and suspected it was caused by excessive sand mining operations.

"Maybe it's from the oil waste dumped into the water. There aren't just one or two machines operating, there are dozens," he noted.

Still, he wasn't sure whether the dwindling *pokea* harvest was also linked to environmental pollution from PT Virtue Dragon Nickel Industry (VDNI), which has operated in Bondoala District for over a decade.

Meanwhile, Bintang Arafah (21), a sand miner in Pusangi Village, Anggalomoare District, admitted that in a single day, each sand dredging machine can process more than ten truckloads of sand.

"Sand miners here have been operating for more than 10 years," he said, adding that most of the sand is ordered from Kendari City.

Regarding the permit for sand mining in the Pohara River, he claimed it was issued by the River Basin Agency (BWS) Sulawesi IV Kendari.

He denied that the sand mining activities in the Pohara River had any impact on the pokea clam population. According to him, if mining truly affected the clams, the fishermen would no longer be around.

Rahim (50) counting his catch of pokea clams. (Photo by Muhammad Sulhijah)

"If sand mining truly affected the pokea population, no one would be harvesting them here anymore," said Arafah. He also claimed that the mining activities did not have a significant impact on the environment, particularly in the Pohara River. "Yes, it's normal. No signs of erosion," he insisted..

Pusangi Village Head, Gama Ali, stated that the extracted sand is only ordered for construction needs in Kendari, and not for projects outside Southeast Sulawesi.

"No shipments have been sent to the new capital city (IKN)[3]. How could we even get it there?" he said.

Currently, more than 20 people are actively mining sand in the village.

3 IKN stands for Ibu Kota Nusantara, the planned new capital city of Indonesia in East Kalimantan.

Meanwhile, A. Apono, Head of the Marine and Fisheries Agency of Konawe Regency, said that the presence of PT VDNI has caused a significant decline in fishery yields.

In 2018, the Central Statistics Agency (BPS) recorded aquaculture production in Konawe reaching 40,356 tons. That number has steadily decreased in the following years in line with the expansion of company operations in the Morosi area..

He also acknowledged that the pokea population in the Konaweha River is in an alarming state.

Pokea, a type of freshwater clam, lives on riverbeds and feeds by filtering particles from the water, making it extremely vulnerable to pollution.

"The *pokea* population continues to decline. Based on preliminary field observations, this species could become extinct within the next 20 years if no conservation efforts are made," said Apono in his office.

According to him, one of the main threats to the *pokea* population is illegal sand mining along the banks of the Konaweha River, in addition to industrial waste from PT VDNI and household pollution, which introduce contaminants into the clams through water filtration.

However, Apono admitted that the Konaweha River water is currently still considered safe. On the other hand, he noted that the *pokea* clams have been contaminated with heavy metals, though, for now, they remain safe for consumption. "Mitigation measures must be taken immediately," he emphasized.

He stressed that strengthening environmental regulations is crucial. All business activities along the riverbanks, including sand mining, must undergo Environmental Impact Assessments (AMDAL) before commencing operations.

"The goal is to ensure no activity worsens water quality or threatens the habitat of local organisms like *pokea*," he said. "As decomposers, *pokea* play a vital role in maintaining the balance of the river ecosystem," Apono concluded.

No Government Attention Yet

Bahtiar, an academic from the Faculty of Fisheries and Marine Science at Halu Oleo University (UHO), emphasized that the government should pay more attention to the sustainability of pokea clams, as they are a regional icon and often used as a substitute for fish.

"My 2012 research showed that sand mining had destroyed *pokea* habitats along a 2-kilometer stretch of the river," Bahtiar said during an interview in his office.

He explained that pokea inhabit the estuarine zone of the Konaweha River for about 15 kilometers but can only survive in freshwater. Once saltwater intrudes, the clams cannot survive. During the dry season, many die in transitional areas, as pokea are highly sensitive to saline water.

Furthermore, the pokea in the Konaweha River have an abundant food supply, thanks to the Aopa swamp estuary which delivers organic material. In the rainy season, water hyacinth covering the river becomes their main food source.

"The most serious threat is environmental degradation, especially from sand mining," Bahtiar explained.

"Mud from mining clogs the pokea's respiratory and digestive systems, because they use the same gills to breathe and filter food. As a result, many pokea die from suffocation."

As for heavy metal contamination, Bahtiar noted that it has not yet become a major issue, since locals typically harvest pokea when they are still young.

"*Pokea* can accumulate metals like iron and nickel, but because of their short lifespan, the levels remain low. It's different if the clams grow very large, the risk of heavy metal accumulation increases," he said.

He added that pokea clams are highly nutritious, rich in protein, calcium, taurine, and amino acids essential for children's bone development.

"*Pokea* can be found in other regions, but they aren't utilized the way they are here. With their promising nutritional value, pokea have the potential to become a flagship commodity, if properly managed," he concluded.

This article was originally published on *Sultrademo.co* on May 4, 2025, and can be accessed via the following link:

https://sultrademo.co/petaka-nikel-dan-penambangan-pasir-di-konawe-yang-merusak-sumber-penghidupan-masyarakat/

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When Profits Speak Louder Than Impact: The Forgotten AMDAL[4]

by Fadli Aksar

Thick black coal dust blows through the air, carried by the wind from PT VDNI-OSS's private port toward residential areas in Motui District, North Konawe, Southeast Sulawesi. (Photo by Fadli Aksar)

The welfare of residents in Konawe Regency has sharply declined since the nickel industry began operating in their area. Instead of bringing prosperity, companies like PT Virtue Dragon Nickel Industry (VDNI) and PT Obsidian Stainless Steel (OSS) are suspected of ignoring environmental impact assessments (AMDAL). The health and safety of residents in Konawe and North Konawe are now threatened by coal dust exposure.

On a scorching afternoon in December 2024, Amir (67) and his wife Suhoria (65) parked their motorcycle in the middle of the road to block coal trucks that passed daily near their fishpond. Several other residents joined in, blocking access roads to the PT VDNI and PT OSS facilities.

The 5-kilometer-long hauling road cuts through the villages of Kapoiala Baru, Lalimbue Jaya, Lalonggombuni, and Muara Sampara. Soon, the truck drivers stopped, and a long queue formed.

4 AMDAL stands for Analisis Dampak Lingkungan or environmental impact assessments. AMDAL is the assessment of the environmental consequences of a plan, policy, program, or actual projects prior to the decision to move forward with the proposed action.

Amir was furious. Earlier that month, the shrimp fry in his hatchery pond in Kapoiala Baru Village suddenly died within ten days of stocking. “Only four shrimp survived. Four fish too. If you want proof, check my fridge,” he told a VDNI employee who demanded evidence of dead fish.

By the pond, Amir saw thick coal dust floating on the water's surface. He believed the dust was the cause of the failed harvest. The dust came from hundreds of fossil-fuel trucks that passed less than 100 meters from his pond daily. Wind carried the fine black particles straight into the water.

Amir is one of many migrants from Bulukumba, South Sulawesi, who settled in Konawe 31 years ago. He arrived in 1993, drawn by stories of successful fish and shrimp farming from relatives. The area was then untouched mangrove and swamp forest, accessible only by boat. Seeing its potential, Amir cleared land and began aquaculture.

A year later, Amir stocked his one-hectare pond with 100,000 vannamei shrimp. Within 2–3 months, they could grow to one ton. In one harvest, Amir could yield 2 to 4 tons of shrimp and milkfish. Harvest cycles came every 2–3 months, and earnings ranged from IDR 200 to 500 million per cycle.

But since 2018, harvests have become rare, down to once a year. Fish and shrimp are smaller, with more frequent mass deaths.

His business collapsed. Once able to support his family and put three children through university, Amir now survives only with the help of his rice field, which too is at risk from the expanding nickel industry. “If it weren't for my rice field, I'd be long gone. There's nothing left to hope for from the pond,” he said.

Amir is not alone. Kamriadi, another fish farmer, also lost hundreds of milkfish in a mass die-off. His pond is located just 100 meters from PT OSS's captive coal power plant.

He recalled opening the floodgate at dawn to let water from the Motui River into his pond. “I thought it was safe, but by morning, they were already floating dead, hundreds of them,” he said. He suspects the cause was toxic wastewater discharged from the coal plant into the river.

Kamriadi noted this was the first mass die-off in five years. Since PT OSS began operations, his production has steadily declined. He used to harvest two tons of milkfish every three months from 20,000 fry. Now, harvests happen only once a year, and fish are significantly smaller. “From 20,000 fry, only two survived,” he said.

Kamriadi and other farmers tried to collect evidence. They found large pipes discharging black wastewater from the captive power plant into the Motui River. “This is what's killing our fish," he said.

Residents met with their village chief and demanded compensation from PT OSS, but their demands went unanswered. Eventually, they blocked the road in protest.

“We're tired of protesting. Nothing ever comes from it," said Anas Fadil, a local resident who joined the demonstration. “If this doesn't work either, maybe it's fate. We've given up. What else can we do?"

Anas Fadil grew up in relative comfort from his father Tajudin's (65) fishpond income. That income once supported his college education. “Now, even getting married is difficult," he said.

Suspected Violations of Spatial Planning and Environmental Impact Assessments (AMDAL)

It's a case of misfortune upon misfortune for residents living near the nickel industry. In addition to economic hardship, they are forced to breathe coal dust–polluted air. Sahir (50), a resident of Motui Village, Motui District, North Konawe, frequently visits the local health clinic due to persistent coughing.

Every day, he and his family inhale air laced with coal dust, which resembles morning fog. The black dust, originating from coal stockpiles owned by the nickel company, drifts into his home. Just ten minutes of being enveloped by the coal dust storm leaves Sahir with stinging eyes, a burning throat, and pain when swallowing saliva or food. According to him, children and the elderly are most vulnerable to respiratory infections and lung disease.

Nur Arafah, a member of the Environmental and Social Impact Assessment Technical Committee, stated that the placement of nickel industrial zones in Morosi, Bondoala, and Kapoiala Districts was inappropriate. She said the development violated regional spatial plans (RTRW), as these areas were designated as water conservation zones supporting agriculture and irrigation. Arafah, who is also Vice Rector III at Halu Oleo University, had even refused to provide academic justification for the project for two consecutive years (2014–2015).

“Altering the spatial plan is essentially a legal way to destroy the environment, because spatial zoning has long been based on ecological logic," she said. “Mining activities directly contradict agricultural and environmental conservation efforts."

The mining companies were only able to operate after the RTRW was forcibly revised by the government and parliament. She criticized this move, calling it an act that delegitimizes environmental protection.

Even if the companies have obtained AMDAL approval, Arafah stressed that they must ensure their activities do not degrade the environment beyond permissible limits. She explained that an AMDAL approval is only granted when a company is deemed capable of managing and mitigating environmental impacts, through sound policy, appropriate technology, and social responsibility.

Arafah believes that the road blockade carried out by Amir and others is a conflict born out of prolonged environmental distress experienced by the local community. According to her, the action is a form of open social conflict that serves as concrete evidence of rising public frustration due to the lack of company response.

"Even just feeling distressed is not permitted, let alone public demonstrations. Once the public starts protesting, that's an open conflict, and it must be addressed and resolved by the company," she said

She urged the government to take firm action, including revoking the license of nickel smelter companies like PT VDNI-OSS, particularly if environmental pollution is found to have caused fatalities. Such sanctions, she added, are regulated under Law No. 32 of 2009 on Environmental Protection and Management.

"If pollution occurs continuously, companies can be sued through a class action lawsuit in court. For evidence, just take a sample," she emphasized.

In addition to scientific methods, Arafah noted that environmental violations can sometimes be identified with the naked eye. For example, if a company promises local jobs and improved livelihoods but fails to deliver on those promises, or if previously clean environments become polluted, those are clear indicators of violation.

"When people's lives were peaceful before the company arrived, and now they're protesting, that itself is evidence of a violation," she said.

These alleged AMDAL violations are also backed by findings from the Southeast Sulawesi chapter of the Indonesian Forum for the Environment (WALHI)[5]. The environmental organization stated that PT VDNI-OSS had ignored key AMDAL requirements, particularly in controlling air and water pollution.

5 WALHI stands for Wahana Lingkungan Hidup Indonesia or the Indonesian Forum for the Environment. WALHI is the largest environmental organization in Indonesia, operating as a grassroots movement for the advocacy, protection, and support of environmental issues.

According to WALHI Southeast Sulawesi Director Andi Rahman, the company failed to install or maintain emission control devices to manage coal combustion from its captive power plant, as required in its AMDAL document.

"That's been neglected for years. We only found out in the past six months, but by then, it was too late. Many residents already suffer from respiratory illnesses due to air pollution from the power plant," Andi said.

WALHI also found that the company had not properly managed leachate or liquid waste. According to Andi, this waste should have been processed within the industrial area to prevent foul odors and dark discoloration when discharged into rivers or the sea.

"We tested the water quality in ponds connected to the Motui River and found toxic contamination, specifically cadmium and lead," Andi explained.

Based on water testing data from the Motui River (Test Report No. 0441/LMIPAUHO/X/2024), a water sample tested on October 21, 2024, for cadmium (Cd) revealed a concentration of 0.0977, exceeding the legal water quality threshold. A subsequent laboratory test on copper (Cu) showed levels at 0.0485, also surpassing the permissible limit.

Further testing on October 18, 2024, involving sediment samples from three points along the Motui River, confirmed contamination by hazardous and toxic substances. These included heavy metals such as cadmium (Cd), copper (Cu), lead (Pb), zinc (Zn), and nickel (Ni).

Beyond water contamination, PT VDNI-OSS is also suspected of neglecting air quality standards due to its mining operations. This suspicion is backed by a study conducted by the Centre for Research on Energy and Clean Air (CREA) in February 2024. The study identified smelter operations as a major contributor to air-pollution-related deaths.

CREA researcher Katherine Hasan stated that the smelter industrial area of PT VDNI-OSS in Konawe Regency is exposed to harmful air pollutants including fine particulate matter (PM2.5), sulfur dioxide (SO), and nitrogen dioxide (NO). She urged the company to fulfil its obligation to control and monitor ambient air quality.

"Even at a glance, it's clear the levels are exceeding the limits," she asserted.

Without the installation and operation of proper air pollution control (APC) technologies, CREA warned that 1.2 million people could be exposed to sulphur dioxide and nitrogen dioxide levels above the daily limit.

Additionally, 7 million people could be exposed to particulate matter (PM2.5) concentrations exceeding safe levels.

CREA further projected that, if left unregulated, the rapid growth of the nickel industry could result in over 3,800 premature deaths by 2025 and nearly 5,000 deaths by 2030.

According to the Environmental Impact Assessment (AMDAL) documents of PT VDNI and OSS, the companies are required to provide covered storage facilities for coal stockpiles within their industrial areas to prevent airborne dust. However, in practice, the coal is stored uncovered, both at the port and within the captive power plant area.

As a result, fugitive dust and emissions have entered residential areas. Fugitive emissions refer to coal dust that hasn't been combusted and remains stored in holding areas.

"This fugitive dust has not been properly controlled by the company. On-site evidence shows coal particles settling on residents' homes," said Andi.

Novita Indri, a campaigner from Trend Asia, stated that nickel industries opt for coal because it is cheaper, while ignoring the serious health and environmental risks. According to her, the dangers of coal-fired power plants (PLTU) are exacerbated by poor management and lack of emissions control by nickel companies.

Even though companies are legally required to submit AMDAL (Environmental Impact Assessment) reports every six months, Novita remains sceptical. "These reports often end up being just paperwork, easily manipulated. In practice, they're often not implemented properly, or even contradict the actual conditions. Sadly, the public has no access to these documents," she said.

She argued that AMDAL documents should be publicly accessible to ensure monitoring and accountability. One practical public oversight tool would be the installation of Air Quality Index (AQI) monitors and display boards in every subdistrict or road surrounding the nickel industrial zone. This would allow the public to track the levels of carbon, nitrogen, and other coal-related pollutants.

Furthermore, air quality monitoring would enable government intervention to enforce environmental standards. "People in Konawe and North Konawe have a right to know the air quality in their area, especially when industry is involved. The government cannot simply look the other way," she emphasized.

According to Novita, the lack of supervision, monitoring, and evaluation in coal management correlates directly with rising cases of acute respiratory

infections (ISPA)[6] and other illnesses. She added that affected communities never receive compensation from the companies, as the illnesses are often dismissed as ordinary health problems unrelated to coal pollutants.

Trend Asia argued that the government should impose strict sanctions on nickel smelters proven to violate environmental standards, ranging from temporary shutdowns, improved emission control systems, to the suspension or revocation of operating licenses.

"But instead of imposing sanctions, the government often avoids enforcing regulations. The local environmental agency (DLH)[7] should have monitoring records. If they don't, we must ask: why haven't they been conducting oversight, especially when respiratory illness is clearly rising?" she said.

The reporter attempted to contact PT VDNI's General Affairs officer, Bahar, and Public Relations officer, Ihsan Umar, but received no response to WhatsApp messages. The same was true for OSS's spokesperson, Edo, who also failed to reply to requests for comment.

According to AMDAL regulations, PT VDNI-OSS is required to: build a coal storage facility for the PLTU with a daily capacity of 22,000 tons; construct air quality control systems equipped with dust filters, SO gas scrubbers, and emission monitoring tools; build wastewater treatment units; Install Flue Gas Desulfurization (FGD) systems to reduce SO emissions; Create storage areas for bottom ash (coal combustion residue); Build B3[8] hazardous waste storage units for slag, fly ash, and bottom ash separately, and construct leachate ponds around the waste storage areas to function as monitoring pools.

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https://matalokal.com/2025/05/08/kala-perusahaan-smelter-nikel-di-konawe-mengabaikan-amdal/#google_vignette

6 ISPA stands for Infeksi Saluran Pernapasan Akut or Acute Respiratory Infection. This refers to a group of illnesses that affect the respiratory system, including the nose, throat, and lungs

7 DLH (Dinas Lingkungan Hidup) refers to the local government environmental agency responsible for managing and protecting the environment, including controlling pollution and environmental degradation.

8 B3 stands for Bahan Berbahaya dan Beracun or Hazardous and Toxic Materials.

La Ode Risman Hermawan

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Digging Wealth, Deepening Poverty: A Paradox in Southeast Sulawesi's Nickel Heartland

by La Ode Risman Hermawan

Maria, 51, a member of the Bajo community in Bambanipa Laut Hamlet, Baliara Village, West Kabaena District, Bombana Regency, Southeast Sulawesi (Sultra). (Photo by La Ode Risman Hermawan/Kendariinfo)

Marine pollution in Baliara Village, West Kabaena District, Bombana Regency, Southeast Sulawesi, caused by nickel mining waste, has made it increasingly difficult for Maria to earn a living. The 51-year-old woman now survives by splitting fish and repairing fishing nets.

Maria's limited access to economic opportunities due to sea pollution has trapped her in poverty. According to the 2022 Baliara Village Profile, she is listed among 213 poor households. "Why am I like this, God?" Maria asked quietly, reflecting on her situation, Monday, March 10, 2025.

The pollution in Baliara's waters has escalated alongside the expansion of nickel mining operations by PT Timah Investasi Mineral (TIM), a subsidiary of PT Timah Tbk, and PT Trias Jaya Agung (TJA). Maria, like most of the 1,442 residents in Baliara, who largely depend on fishing, has long relied on the sea for her livelihood.

For the Bajo people like Maria, going to sea is more than a livelihood; it's a cultural identity. A similar fate has befallen seaweed farmers in Torobulu Village, Laeya District, South Konawe Regency. Since PT Billy Indonesia (BI) began nickel mining in Torobulu in 2010, local farmers have completely ceased seaweed production.

Residents once resumed seaweed farming after PT Billy Indonesia (BI) ceased operations in 2016. Unfortunately, in 2019, PT Wijaya Inti Nusantara (WIN), BI's successor, began aggressive operations, in line with President Joko Widodo's nickel down streaming policy.

Under Regulation of the Minister of Energy and Mineral Resources (ESDM) No. 11/2019, which amends Regulation No. 25/2018 on Mineral and Coal Mining, nickel mining activities in Torobulu have intensified.

The renewed mining activities have once again destroyed the livelihood of seaweed farmers along the Torobulu coast. According to local resident Kamaruddin, the nickel company is to blame for the destruction of seaweed farms in his village. He recounted his attempt to restart farming in 2022.

That year, Kamaruddin invested IDR 1 million to restart seaweed cultivation but suffered total losses. Mining debris from excavation sites flowed into the sea, contaminating the water and damaging the seaweed. "The red soil flows from the top. When it hits the seaweed, it turns white, breaks apart, and dies completely, nothing left," Kamaruddin said on February 28, 2024.

In Okooko Village, Kolaka Regency, Arifin, head of the Lowania Farmers Group, expressed long-standing concerns about muddy water from nickel mine runoff entering his rice fields. He said the rice stunted, produced fewer tillers, and turned yellow. "Here's an example," he said, pointing to a patch of rice field next to an irrigation channel (March 19, 2025).

Arifin and other farmers rely on irrigation from the Okooko River, which runs through Pomalaa and Tanggetada Districts. The river water is now yellow-brown, polluted by sediment from abandoned mining sites. "The impact is enormous, this isn't a trivial issue," Arifin said.

Environmental damage has severely disrupted or even eliminated the livelihoods of people outside the nickel mining sector. Farmers and fishers are increasingly unproductive, resulting in rising poverty and income inequality.

In Baliara, 213 out of 401 households were classified as poor in the 2022 Village Profile, meaning over half of the population lived in poverty.

The situation is similar in Torobulu. Based on the 2024 Village Profile, 420 of the 450 households were classified as underprivileged, nearly the entire village.

In Okooko, only three households out of 428 were classified as underprivileged in 2024. However, the overall poverty levels across the three nickel-producing regencies have increased significantly over the past five years. In Bombana Regency, the number of poor residents rose from 18,840 in 2020 to 20,560 in 2024. South Konawe (Konawe Selatan/ Konsel) experienced a similar trend, with poverty increasing from 34,220 residents in 2020 to 37,090 in 2024. In Kolaka Regency, the figures jumped from 23,760 in 2020 to 33,200 in 2024. These numbers highlight a troubling correlation between the rapid expansion of nickel mining and the worsening economic conditions of the local population.

Rising Tides of Poverty

Infographic: Factors Behind Rising Poverty in Southeast Sulawesi's Three Nickel-Producing Regions[9].Design by Chevin Breemer.

Southeast Sulawesi's economy grew steadily at an average annual rate of 5.58 percent between 2013 and 2022. The only notable decline, a drop of 0.65 percent, occurred in 2020 due to the Covid-19 pandemic. However, this economic growth has often come at the expense of environmental quality.

According to the Environmental Kuznets Curve hypothesis, environmental degradation should decline once the economy reaches a certain level of development, as public awareness and efforts to protect ecosystems increase. Yet, La Baco Sudia, an environmental science lecturer at Halu Oleo University in Kendari, explains that economic growth driven by natural resources tends to leave environmental damage behind.

Baco cited marine pollution in Baliara and the loss of seaweed farming in Torobulu as examples of poor environmental management. “That's the

9 This infographic outlines the factors contributing to rising poverty in three nickel-producing regions of Southeast Sulawesi. A study by the Development Economics Department of Halu Oleo University (UHO) in Kendari (2013–2022) found no evidence of a trickle-down effect; in fact, every 1% increase in economic growth was associated with a 0.248% rise in poverty. Poor governance and environmental degradation caused by mining activities have reduced local productivity and forced communities to seek alternative livelihoods, while the economic benefits are largely captured by elites and investors. Efforts to address environmental damage are often misguided, focusing more on global narratives like energy transition rather than tackling the root causes of local deforestation and ecological harm.

theory. In practice, investment for economic growth in resource sectors is supposed to follow agreed environmental documents. If companies complied, there would be no severe environmental damage," Baco said on Friday, April 25, 2025.

Infographic of economic growth and poverty rates in Southeast Sulawesi[10]*. Design by Chevin Breemer.*

Poor environmental governance has emerged as a key factor behind worsening local economic conditions, according to La Baco Sudia, Environmental Science Lecturer at Halu Oleo University (UHO) in Kendari. He explains that environmental degradation directly contributes to poverty by disrupting key livelihoods such as farming and fishing. “Environmental damage leads to increased poverty. When the sea is polluted or farmlands are flooded, it reduces productivity for both farmers and fishers," he said.

For those working directly in nickel mining, the effects may not be immediate. However, Baco warns of long-term consequences: “If someone consumes fish contaminated with lead waste, it can pose serious health risks. And consider how much must be spent on medical treatment," he explained.

The same concern is echoed by Caesar Muslim, an economist and Development Studies academic at UHO Kendari. He highlights that environmental damage caused by nickel mining can directly intensify poverty, as it forces farmers and fishers to adapt and search for new livelihoods. “In my view, the link

10 The upper chart of the infographic shows the Economic Growth Rate of Southeast Sulawesi from 2013 to 2022, while the lower chart displays the Number of People Living in Poverty in the same province over the same period. Source: Statistics Indonesia (BPS) Southeast Sulawesi.

exists, even though empirical studies are needed to strengthen it. Pollution from mining activities clearly disrupts the livelihoods of local communities, who then need time to adjust," Caesar said on Monday, April 21, 2024.

His 2024 research also addresses the contradiction in Southeast Sulawesi's economic trajectory. Despite a decrease in absolute poverty, from 331,710 people in 2013 to 309,790 in 2022, the root causes of poverty remain unresolved.

Over the past five years, poverty in Southeast Sulawesi has gradually increased, from 301,820 people in 2020 to 319,710 in 2024. Economist Caesar Muslim's research concludes that economic growth in the region has not alleviated poverty; instead, it has worsened it. Using a simple linear regression model, Caesar found that for every 1 percent increase in economic growth, the poverty rate in Southeast Sulawesi also rises by 0.248 percent.

Infographic of the number of poor residents in Bombana, South Konawe, and Kolaka Regencies[11]*. Design: Chevin Breemer.*

Economic growth and the resurgence of poverty can be attributed to various factors, including economic, social, and political dynamics, as well as the unequal distribution of wealth. The benefits of growth are often concentrated among a small segment of society.

11 This infographic shows that the number of poor residents and poverty rates in Bombana, Kolaka, and South Konawe (the three major nickel-producing regions in Southeast Sulawesi) remained persistently high from 2020 to 2024, despite ongoing economic growth. The data highlights a consistent disconnect between resource extraction and poverty reduction.

This reflects the theory of the "natural resource curse" introduced by Professor Richard Auty in his book *Sustaining Development in Mineral Economies: The Resource Curse Thesis*. The findings also align with a study by Caesar titled *The Impact of Economic Growth on Poverty in Southeast Sulawesi*, which challenges the trickle-down effect. The theory suggests that economic growth should reduce poverty through job creation and broader welfare gains. However, in the context of nickel mining, the benefits tend to be captured by wealthy elites and investors.

"The theory says that growth should reduce poverty. But my research found the opposite. While the economy grows, poverty levels increase due to lack of equitable distribution," Caesar explained.

Andi Rahman, Executive Director of WALHI Southeast Sulawesi, observed that local communities hardly benefit from the nickel boom. Most nickel mining permits in Bombana, South Konawe, and Kolaka are held by outsiders, including investors from Java, Kalimantan, and even Chinese nationals.

As a result, the wealth generated is often extracted from the region. "If we track the companies, many of them are owned by outsiders. That means the profits are taken elsewhere. The exception might be PT Tonia Mitra Sejahtera in Kabaena, which is owned by Governor Andi Sumangerukka," he said on April 17, 2025.

Only a small fraction of the local population benefits from mining-related employment. In Baliara, only 20 of the 1,442 residents work in mining. In Torobulu, only 80 of the 3,132 residents are employed in private sector roles, including mining. In Okooko, 110 of the 1,477 residents work for private companies.

"The core issue is that only 15 to 20 percent of locals are involved in the industry, while their traditional sources of livelihood are being destroyed," Andi added.

Southeast Sulawesi Sets Green Agenda, But Doubts Remain

The Head of the Southeast Sulawesi Environmental Office (DLH), Andi Makkawaru, stated that the province's vision for addressing environmental degradation is now aligned with the national commitment to sustainable development. This agenda is reflected in the Asta Cita, a key policy platform of the President and Vice President of Indonesia. One of the Asta Cita points, he emphasized, is also embedded within the 100-day work program of the newly elected Governor and Vice Governor of Southeast Sulawesi, Andi Sumangerukka and Hugua, through a sustainable economy program.

"Green economy refers to land areas, while blue economy refers to our coastal and marine zones," Andi explained during an interview on Tuesday, April 29, 2025.

To support this initiative, the Southeast Sulawesi Provincial Government will utilize grant funding sourced outside of the state and regional budgets (APBN and APBD)[12]. In 2025, the province received an allocation of Rp2 billion from the Environmental Fund Management Agency (BPDLH), a non-echelon unit under Indonesia's Ministry of Finance. The funding is set to support environmental management programs for the next three years.

In addition to national support, the provincial government is also targeting funding from the Green Climate Fund (GCF), a global financing mechanism designed to help developing countries reduce greenhouse gas emissions and build resilience to climate change.

"There are funding mechanisms outside the state or regional budgets that do not burden the government or the nation. One of them is the environmental protection fund, or what we call the Green Climate Fund. Praise be to God, this year we've already begun sharpening our efforts through the REDD+ program," Andi added, referring to the UN-backed initiative Reducing Emissions from Deforestation and Forest Degradation.

The REDD+ scheme, as Andi explained, represents a global commitment to mitigating the risks of deforestation and forest degradation. It is part of a broader international agreement under the United Nations Framework Convention on Climate Change (UNFCCC), established in 1992.

In addition to pursuing climate funding, the Southeast Sulawesi government will also seek to boost fiscal revenues through taxes on mining companies that have caused extensive deforestation and accelerated climate change. Andi pointed out that these various financial mechanisms would particularly target the province's coastal communities, which he identified as the most vulnerable to the impacts of environmental damage.

"The communities most affected by climate change are those in coastal areas. For example, when mining occurs uphill, the waste flows into the ocean during heavy rains. Then, when storms hit and sea levels fluctuate unpredictably, it's the coastal populations that suffer," he explained.

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12 APBN stands for Anggaran Pendapatan dan Belanja Negara or State Revenue and Expenditure Budget. APBD stands for Anggaran Pendapatan dan Belanja Daerah, which means Regional Revenue and Expenditure Budget. In essence, APBN is the national budget, while APBD is the budget for regional governments (provinces, regencies, or cities).

Despite the optimistic tone from the provincial government, environmental advocates remain sceptical. Andi Rahman, Executive Director of WALHI Southeast Sulawesi, expressed doubt that talk of sustainable economics will lead to real progress, unless it includes a transition away from critical minerals like nickel. He pointed to the government's nickel down streaming policy as a case in point: a program that was supposed to optimize the economic potential of natural resources and improve public welfare, but in practice has delivered mixed results.

"The goal of down streaming nickel is admirable, it's supposed to bring prosperity. Conceptually, we all agree. But I remain pessimistic, because what's happening on the ground consistently contradicts the vision," he said.

La Baco Sudia, an environmental science lecturer at Halu Oleo University in Kendari, shared similar concerns. He argued that Indonesia might only transition from critical minerals to cleaner energy sources when the environmental consequences become impossible to ignore.

"The vision is good, and maybe we'll get there. But in Indonesia, we tend to act only after disasters happen. We need to remember: restoring environmental damage is extremely costly," he warned.

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https://kendariinfo.com/meningkatnya-kemiskinan-daerah-penghasil-nikel-di-sulawesi-tenggara/

The Sea No Longer Sings: Bajo Lives Threatened in Kabaena

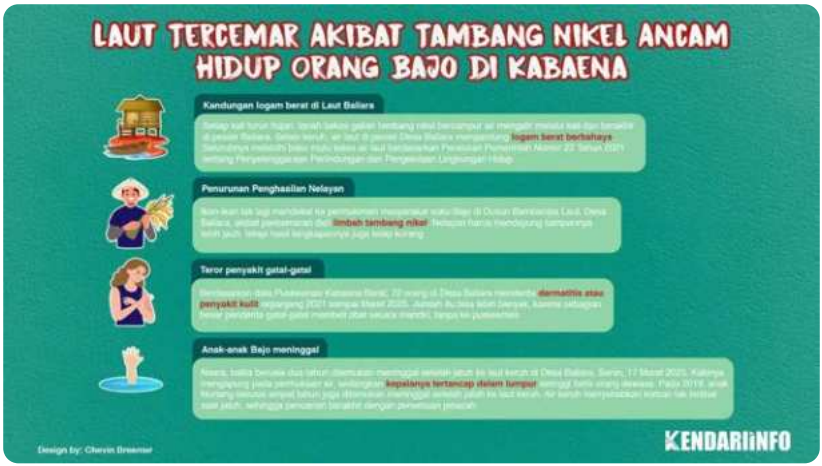
by La Ode Risman Hermawan

Residents of the Bajo community walk across a wooden bridge over murky waters in Bambanipa Laut Hamlet, Baliara Village, West Kabaena District, Bombana Regency, Southeast Sulawesi. (Photo by La Ode Risman Hermawan/Kendariinfo)

Maria has found it increasingly difficult to catch fish ever since the waters off Baliara Village, in West Kabaena District, Bombana Regency, Southeast Sulawesi (Sultra), turned murky and polluted. The contaminated sea has forced the 51-year-old to paddle her canoe farther from shore in search of a catch.

The pollution in Baliara began around 2014, following the rapid expansion of nickel mining activities by PT Timah Investasi Mineral (TIM), a subsidiary of PT Timah Tbk., and PT Trias Jaya Agung (TJA). Each time it rains, runoff from excavated mining sites flows into nearby rivers, eventually emptying into the coastal waters of Baliara.

"In the past, even a falling needle could be seen clearly in the water. Now, you can't even see a spoon if it drops into the sea. When that happens, I have no choice but to buy a new one," Maria said.



Infographic of the Impact of Nickel Mine Waste on Coastal Waters in Baliara Village, West Kabaena District, Bombana Regency, Southeast Sulawesi[13]*. Design by Chevin Breemer.*

The accumulation of sediment has turned the seawater in Baliara murky and reddish throughout the year. Beyond the visible pollution, the sea now harbors dangerous levels of heavy metals.

A joint study conducted in 2024 by WALHI Southeast Sulawesi and Satya Bumi revealed alarming concentrations of toxic substances in the coastal waters of Baliara. The seawater was found to contain 0.377 milligrams per liter of ammonia (NH_3-N), 0.12 milligrams per liter of nitrate (NO_2-N), and 0.079 milligrams per liter of sulfide (H_2S). Mercury (Hg) was detected at 0.0022 milligrams per liter, while cadmium (Cd) reached 1.049 milligrams per liter. Additionally, copper (Cu) levels stood at 0.059 milligrams per liter, lead (Pb) at 0.554 milligrams per liter, zinc (Zn) at 1.185 milligrams per liter, and nickel (Ni) peaked at 3.464 milligrams per liter.

These values far exceed the permissible limits set by the Government Regulation No. 22 of 2021 on the Implementation of Environmental Protection and Management, particularly for waters designated for port activities, marine tourism, and the sustainability of aquatic life. The presence of such pollutants underscores the severity of environmental degradation in Baliara, much of which has been attributed to unchecked nickel mining operations.

13 This infographic outlines four key impacts of nickel mining on the Bajo community in Kabaena, presented from top to bottom: the presence of heavy metals in Baliara's coastal waters, declining fisher incomes due to pollution, increased cases of skin disease, and the tragic death of a Bajo child linked to muddy and polluted seas.

Infographic of seawater quality testing results in Desa Baliara, Kabaena Barat District, Bombana Regency, Southeast Sulawesi[14]. Design by Chevin Breemer.

Fish no longer come close to the stilt houses of the Bajo people in Dusun Bambanipa Laut, a coastal settlement in Baliara Village, West Kabaena District, Bombana Regency. When the sea was still clear, Maria, a 51-year-old resident, used to catch up to 10 kilograms of fish just around her home. Working from morning until midday, she earned between IDR 100,000 to 120,000 daily.

"Since the water turned red, I've had to go farther out to fish. Even if I leave in the morning and come back in the evening, I usually only get three kilograms. Five kilos is the best I can do now," she said.

Maria's aging *sampan*, battered by time and weather, has forced her to stop fishing altogether. From her wooden house built on stilts over the now murky sea, she walks along a narrow wooden bridge to point out her broken boat, its hull tethered with rope to the base of the walkway near her neighbor Nurtang's house.

Though advancing in age, Maria says she's still strong enough to row out to sea. But her small boat, with peeling green paint, is no longer repairable. The hull is nearly split apart, and patching it with glue is no longer an option. She's never received any support to replace it.

14 This infographic presents the results of 2024 seawater quality testing in Baliara Village, Southeast Sulawesi. The measurements are compared against three national water quality standards (presented from left to right): for port waters, marine tourism, and marine biota. Source: WALHI Southeast Sulawesi.

What frustrates her most is the apparent inequality in aid distribution. Several other fishermen in the village, she claims, have received motorized boats from government programs. But those boats, she says, are only given to people with close ties to village officials. “They never gave me anything,” she said.

To make ends meet, Maria now spends her days splitting fish or mending damaged fishing nets. But those jobs are not consistent. The work of slicing fish for drying only comes occasionally, whenever local fishermen need her help. The pay is meager, just IDR 1,000 per kilogram. On days without fish-splitting work, she turns to net repairs.

“Right now, I split fish. If someone asks me to mend their nets, they pay me. If the damage is big, I get IDR 60,000. If it's small, I get IDR 50,000. That's what I use to buy rice and sugar,” Maria said.

But when neither job is available, Maria has no income at all. She must rely on her son-in-law, Hasni's husband, who is also a fisherman. “Luckily, I have a child. If her husband brings in some catch, we can eat,” she added.

Maria is not alone in her hardship. Her older brother, Lias R., 56, faces a similar struggle. Maria walks the rickety wooden bridge over the murky sea to visit him. Approaching the back of his house, she calls out. The porch is tilted, and some of the wooden floorboards are rotting and full of holes.

Lias comes out and sits on the sturdier part of the deck. He hasn't been fishing for months, his boat, worn down by years of use, is now beyond repair. “How can I go fishing with no boat? If I swim, I'd drown,” he said with a wry smile.

His boat has been out of commission for three months. Unable to fix it, he removed the motor and stored it on the back porch. Since then, Lias occasionally works splitting wet fish to be dried, earning just IDR 50,000 for every 50 kilograms, a task that takes him two to three days.

But this work isn't regular either. Often, Lias depends on handouts from his children or nieces and nephews, who sometimes slip him IDR 20,000 or 50,000. “If they don't help, I'd starve. If I still had a sampan, I could earn a bit of money for daily needs,” he said.

Even with his boat out of commission, Lias could still dive and spear fish or octopus near his home, if the sea was clear. But murky, polluted waters now obscure the ocean floor. “There was never a shortage of fish when the water was clear. I used to spear them underwater. Now, what's left to shoot? You just end up crashing into rocks,” he explained.

With no means to fish and no assistance from aid programs, Maria and Lias are left with little but fish-splitting labor and the generosity of their relatives. What stings more is the exclusion they feel from state aid. “I used to ask, why did they get boat aid while I didn't? The answer was always, ‘They need it.' So I guess people like me don't," Lias said bitterly.

Health Crisis Haunts Bajo Children

Nurtang, 34, holds a photo of her daughter who died after falling into the murky sea near their home in Dusun Bambanipa Laut, Baliara Village, West Kabaena District, Bombana Regency, Southeast Sulawesi. (Photo by La Ode Risman Hermawan/Kendariinfo).

Nickel mining has taken a deadly toll on the children of the Bajo community in Dusun Bambanipa Laut, Desa Baliara. On Monday afternoon, March 17, 2025, the village was shaken by the sudden death of a toddler named Nasra, daughter of Anas and Rahmi. Residents discovered the two-year-old's lifeless body floating in the murky seawater shortly after returning from afternoon prayer. Her legs were visible above the water's surface, while her head was buried in mud as deep as an adult's calf.

This was not the first time tragedy had struck. “You don't see it happen when kids fall. It's only once they've become a corpse that anyone notices," said village head Suryadi on March 26, 2025. In 2019, Nurtang lost her four-year-old daughter in a similar incident. The child fell into the muddy sea beneath their stilt house while relieving herself. Nurtang recalled hearing her daughter call her name, asking for help cleaning up. But when she rushed over, her daughter had already vanished. “She called me to wipe her, but when I got there, she had already fallen. You can't see anything in this kind of water. I cried right there," said Nurtang on March 10, 2025.

Her daughter's body was eventually found floating under a neighbor's house, about 30 meters from their own. Nurtang said the murky yellow-brown water has made children in the Bajo community fearful of swimming.

They now only swim occasionally around Pulau Mataha, some 3 kilometers away from the village.

Children of the Bajo community have stopped swimming near Dusun Bambanipa Laut, fearing skin rashes and infections. Data from the Kabaena Barat Community Health Center confirms 72 reported cases of dermatitis in Desa Baliara between 2021 and March 2025, believed to be caused by exposure to the now-polluted seawater.

Infographic showing the number of dermatitis cases in Desa Baliara, Kabaena Barat District, Bombana Regency, Southeast Sulawesi. Design by Chevin Breemer.

One of those suffering from persistent itching is Lias, who believes his skin condition began when the seawater turned murky. He suspects the actual number of dermatitis cases may be higher than reported, as many residents prefer to self-medicate rather than visit the local health clinic. "I didn't go to the hospital, I just bought medicine," Lias said.

Despite bearing the brunt of nickel mining's adverse effects, local residents have never received compensation. Tatang, the Head of Mining Engineering (KTT) at PT Timah Investasi Mineral (TIM), said the company only provides community development programs (PPM) and corporate social responsibility (CSR) initiatives, all of which are distributed through the village government.

Direct monetary compensation, which residents have requested since the beginning, is off the table. Tatang explained that this is in line with the

policy of PT Timah (Persero) Tbk., the parent company. “We cannot provide compensation in the form of money. We follow PT Timah's guidelines," he stated on Tuesday, March 11, 2025.

Nickel Waste in Kabaena Sea

Lias R., 56, a member of the Bajo community in Bambanipa Laut Hamlet, Baliara Village, West Kabaena District, Bombana Regency, Southeast Sulawesi. (Photo by La Ode Risman Hermawan/ Kendariinfo)

On Saturday, January 11, 2025, residents were seen hauling mud into sacks beneath the stilt houses of the Bajo community in Bambanipa Laut Hamlet, Baliara Village. The mud, believed to be nickel mining waste, had settled under their homes. Workers were paid Rp5,000 per sack of mud they removed.

Lias, a local resident, confirmed the activity but said he did not take part. According to him, the sacks were limited, and many residents competed for them. “We don't even know who's paying. I never went there because people were scrambling to get sacks," Lias said.

Tatang, a representative of PT TIM, denied that the company's operations had caused seawater pollution in the coastal area of Baliara. He argued that PT TIM's mining activities were located far from the coastline and that sedimentation ponds had been built around the mining site. He suggested the mud could have come from other sources, such as agricultural runoff or graveyard landfills.

“People always point fingers at Timah. But we've already built several sediment ponds. The water management system at the mine is in place. As for the mud near the coast, the distance from the mine to the sea is quite far. Runoff from local farms or graveyard fill could also contribute to the sedimentation," he explained.

Despite these claims, it was PT TIM itself that coordinated the removal of the coastal seabed sediment in Baliara. The company initiated a program

asking locals to manually dig up the mud and place it into sacks. For each sack collected, workers were paid Rp5,000. The sacks were then transported by truck.

"The residents collect the mud themselves. This is really just a temporary solution. It's a way to compensate them for their efforts. Participation is voluntary, if someone doesn't want to do it, we'll find someone else who does. We're not forcing anyone," Tatang said, acknowledging that the program had received mixed reactions.

Andi Rahman, Executive Director of WALHI Southeast Sulawesi, argued that local fishers like Maria and Lias were merely left with the scraps of the nickel mining boom. Since mining operations by PT TIM and PT TJA began, the environment, economy, and public health in Baliara have all deteriorated significantly.

"I don't see any prosperity brought by the mines to the local community. What used to be their primary sources of livelihood have been polluted, damaged, and the impact has been largely negative," he said.

However, Baliara Village Head Ancu bin Duka dismissed concerns that the mud had affected residents' income, claiming that most locals still worked as fishers. He described the criticism as exaggerated and said the mining mud only impacted residential areas.

"It's not true that many fishers have lost income. It doesn't really interfere with their work, there are just people trying to create a narrative. If we talk about impacts, it's mostly on the housing area," Ancu said on Tuesday, March 11, 2025.

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https://kendariinfo.com/laut-tercemar-akibat-tambang-nikel-ancam-hidup-orang-bajo-di-kabaena/

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Breathing Dust, Counting Losses

by Randi Ardiansyah S

The Captive Coal-Fired Power Plant (PLTU) of PT Obsidian Stainless Steel (OSS), located in Tani Indah Village, Kapoiala District, Konawe Regency, Southeast Sulawesi. (Photo: Courtesy)

In Tani Indah Village, the evening sky hangs gray. Smoke and dust swirl in the air like a drifting fog. In the distance, the towering chimneys of PT Obsidian Stainless Steel's (OSS) captive coal-fired power plant in Konawe, Southeast Sulawesi (Sulawesi Selatan/ Sultra), release dark plumes that slowly drift toward residents' homes.

The dust settles not only on rooftops and yards, it seeps into daily life, into wardrobes, onto stacks of clean dishes, into the arms of breastfeeding mothers, and even into the final breaths of a grandmother in an ICU room.

For the past seven years, the people of Tani Indah and neighboring villages have lived under a constant haze. Since PT OSS began operations in 2018, clean air has gradually become a memory. In its place, a quiet grief has grown, one not recorded in corporate reports.

One afternoon in early April 2025, in Tani Indah Village, Kapoiala District, Konawe Regency, Southeast Sulawesi, Samsuddin sat in silence on the porch of his stilt house, struggling with increasingly labored breathing. He had just returned from tending his fish pond, located only a few meters from the captive coal-fired power plant (PLTU) operated by PT Obsidian Stainless Steel (OSS). Now 65 years old, his body is frail, and his health has been deteriorating. For over three months, the fish in his pond have not been reproducing properly. A process that used to take just two to three months from seeding to harvest has now stalled. "It's difficult now," he said with a strained smile.

Samsuddin settled in Tani Indah in 1993 after seeing its rich potential for aquaculture. Back then, the area was dense forest and swamp along the Motui River estuary. Leaving his hometown of Bulukumba in South Sulawesi, he came with nothing but determination and hope for a better life. He started with a single plot for milkfish farming and eventually expanded to seven, turning small harvests into tons of fish.

But good fortune turned into disaster when thousands of trucks began dumping fill material at the river's edge to build what would become an artificial island housing the OSS power plant. Locals believe this development triggered severe environmental degradation in the area.

Samsuddin sits in silence on the porch of his stilt house, struggling to breathe, as seen in early April 2025. (Photo by Randi Ardiansyah).

In 2023, Samsuddin required intensive treatment at the Kendari Regional General Hospital (RSUD). He traveled 22 kilometers from his village to the provincial capital to seek proper medical care. There, he met Dr. Wa Ode Zerbarani, head of the hospital's radiology department, who recommended a thoracic X-ray to examine his chest.

"The doctor said my breathing problems are because of the dust. She asked where I lived, and whether there was coal nearby. I told her coal dust flies everywhere, the plant is right beside my house," Samsuddin recalled.

The radiology report, dated July 25, 2024, diagnosed Samsuddin with emphysema and bilateral pulmonary fibrosis, both chronic lung conditions. The doctor told him that his lungs contained fine black and white dust particles. She advised him to wear a mask at all times, even while sleeping. “She said even inside a mosquito net, the fine coal dust can get in," he said.

The River Turns Black, the Ponds Die

For residents of Tani Indah, the struggle goes beyond air pollution, it extends to water contamination. The Motui River, once the lifeblood of local fish farmers, has turned dark and polluted. On October 7, 2024, at around 3 a.m., Kamriadi, a 36-year-old fish farmer, followed his usual routine of channeling river water into his pond. In the darkness, he opened the water gate, unaware of the disaster about to unfold. By dawn, he received devastating news, his neighbor reported a mass fish die-off. Rushing to his pond, Kamriadi was met with the sight of hundreds of dead milkfish floating lifelessly, their value lost overnight.

He suspected the fish had died due to pollution from coal waste discharged by the nearby power plant. His suspicions were backed by his own observations, he had seen black wastewater dumped directly into the river and recorded video evidence. Since the power plant's arrival, Kamriadi's income has plummeted. He used to earn up to Rp200 million per harvest cycle from milkfish, vannamei shrimp, black tiger prawns, and crabs, enough to sustain his family and invest in land. “Before, one pond could yield a ton of milkfish in one harvest, and I had seven ponds across 13 hectares. Shrimp could reach 500 kilograms. Now, I can't even survive," he said.

He estimates a 70% drop in productivity since the plant began operating. In one incident alone, around 18,000 fish died, costing him Rp25 million. Cumulatively, he estimates losses of around Rp1 billion between 2018 and 2024. Kamriadi once contacted the company's public relations office to report the issue, but instead of resolution, he was met with baseless accusations, claims that he had poisoned his own fish. “I stayed quiet. What else can I do? Even bigger cases get no attention," he said with resignation.

The most painful incident, he recalled, occurred in 2022, when the company destroyed the water gate of his pond, citing the presence of a land embankment. He reported it to the police, but the case remains unresolved. Beyond financial loss, Kamriadi and his family must now endure daily exposure to pollution. Living close to the plant, his family's health has suffered. His father was diagnosed with a severe respiratory infection in

2019, believed to be caused by coal dust exposure. Every morning, their yard is covered in black soot.

"I've seen the smoke myself, thick, black, sometimes yellow. The wind always blows from the direction of the plant. We are surrounded on three sides," he said.

Kamriadi lives next to the captive power plant of PT OSS, just about 200 meters from his home. (Photo by Randi Ardiansyah)

The suffering of residents in the areas surrounding PT Obsidian Stainless Steel's (OSS) captive coal-fired power plant doesn't end with air pollution. Landfilling with solid waste from coal combustion has further worsened conditions. When the tide rises, polluted seawater flows into local fish ponds, damaging aquatic ecosystems and livelihoods.

Kamriadi is not alone in facing these hardships. Daeng Kadir, a 49-year-old resident of Motui Village, located right on the border with the PT OSS plant, shares a similar fate. For the past three years, he has faced continuous harvest failures due to coal dust pollution, which he believes is killing his fish. Compounding the problem, wastewater from the power plant continues to be discharged into nearby rivers, further contaminating local fish ponds.

"The worst is during the rainy season," Kadir explained. "The PLTU's runoff flows straight into the river and into our ponds. Sometimes the water looks oily, and when it's like that, the fish die immediately. When the water's black with coal dust, they don't die right away, but they stop growing."

According to Kadir, coal dust contamination became noticeable about a year after the plant began operations. He recalls that before the plant, his ponds could yield up to Rp50 million per hectare every three months. But now, most of the fish die before harvest. “Nowadays, we can't even talk about harvesting or growth, everything's dying,” he said.

Due to the damage to his ponds and water sources, Kadir estimates losses reaching hundreds of millions of rupiah. “The capital for one hectare is around Rp30 million,” he noted.

The power plant has not only destroyed his fish ponds but also contaminated his clean water supply. Kadir's household well is no longer usable due to coal dust infiltration. “I had to seal the well. The water's mixed with coal dust and can't be used anymore. We now have to buy tower water for bathing and washing,” he said.

Many other residents share Kadir's burden. To access clean water, they must purchase 1,200 liters of tower water for Rp50,000, an added economic strain.

WALHI Southeast Sulawesi has confirmed heavy metal pollution in the Motui River, which feeds dozens of hectares of residents' ponds. Laboratory tests conducted in October 2024 on samples from the river and local ponds confirmed contamination.

WALHI's Executive Director, Andi Rahman, described the environmental condition in Tani Indah and other villages around the PT OSS and PT VDNI mining zones as deeply alarming. The continuous operation of smelters and captive power plants without strict environmental controls has severely harmed ecosystems and the livelihoods of surrounding communities.

Villages like Tani Indah and Motui are showing signs of severe environmental degradation. Industrial byproducts such as fly ash and bottom ash are scattered across main roads, left unmanaged, contributing to widespread pollution.

“These industrial activities have polluted the foundations of people's livelihoods, fish ponds, farmland, and coastal waters. It's not just the economy that's affected; public health is deteriorating too,” Andi explained.

“Data from several community health clinics,” he continued, “show a significant rise in acute respiratory infections (ISPA) and digestive disorders (dyspepsia) over the past few years.” WALHI suspects that air pollution, local climate shifts due to deforestation, and chemical contamination from industrial waste are the primary causes.

Despite regulations requiring companies to submit Environmental Management and Monitoring Reports (RKL/RPL)[15] every six months, Andi said, "In practice, the companies show no real action. Monitoring and evaluation seem to be just paperwork, disconnected from residents' lived experiences."

In the three years, WALHI has been assisting the affected communities, no meaningful action has been taken by the companies to improve the situation. "This responsibility is not optional, it's mandated by law. But instead of accountability, residents are left to suffer while companies continue operating without proper environmental evaluations," he said.

According to environmental projections, if this situation continues unchecked, areas around Morosi could become uninhabitable within the next decade, due to persistent coal dust exposure and accumulated environmental damage.

To date, the companies have failed to address community complaints. Liquid waste dumping into rivers continues, killing fish ponds and polluting water. What once served as the economic backbone of these communities has collapsed, leaving residents with devastating financial losses and a drastically reduced quality of life.

Contaminated by Heavy Metals

Recent laboratory tests conducted by WALHI in October 2024 on water quality in aquaculture zones around Morosi, Konawe, have revealed alarming findings. Two heavy metal parameters, cadmium (Cd) and copper (Cu), were found to significantly exceed the national water quality standards set by the Indonesian National Standard (SNI).

Using SNI 6989.16-2009 for cadmium and SNI 6989.6-2009 for copper, the tests showed cadmium levels at 0.0977 mg/L, nearly 100 times higher than the safe threshold of 0.001 mg/L. Copper concentrations were recorded at 0.0485 mg/L, also far above the acceptable limit of 0.002 mg/L. Meanwhile, other heavy metals such as lead (Pb), zinc (Zn), and nickel (Ni) were still within safe limits.

Excessive cadmium levels have a direct impact on aquaculture species like fish and shrimp, causing gill damage, metabolic disruption, and organ

15 RKL and RPL stand for Rencana Pengelolaan Lingkungan Hidup (Environmental Management Plan) and Rencana Pemantauan Lingkungan Hidup (Environmental Monitoring Plan). These are two key components of AMDAL that outline how a project will manage and monitor its environmental impacts.

failure, especially in the liver and kidneys. Over time, cadmium can hinder reproduction and weaken disease resistance in aquatic organisms. In the broader ecosystem, cadmium settles into pond sediments, contaminates the food chain through bioaccumulation, and poses a long-term contamination threat.

Copper poses similar dangers, potentially triggering acute toxicity in fish and shrimp, disrupting nervous systems, and causing sudden mass die-offs. Ecosystem quality is also compromised, with reduced dissolved oxygen levels and damaged aquatic microbial communities.

Beyond aquatic life, human health is also at risk. Residents who consume fish and shrimp from these contaminated ponds face potential cadmium exposure, which is associated with kidney damage, bone fragility, and cancer, according to WHO and Indonesia's Ministry of Environment guidelines. Chronic copper exposure can lead to digestive issues, liver and kidney damage, and cardiovascular problems.

WALHI has called for stricter enforcement of water quality standards and regular environmental monitoring. Measures such as filtration systems, biofilters, and stricter oversight of industrial and agricultural waste near aquaculture zones are urgently needed to prevent further pollution.

If left unaddressed, WALHI warns, the region could soon become unfit for aquaculture and even human habitation. They urge both local and national governments to conduct immediate evaluations, enforce environmental laws, and initiate ecosystem restoration to protect affected communities and preserve the surrounding environment.

Data from the Southeast Sulawesi Central Bureau of Statistics (BPS) has already recorded a decline in aquaculture production in Konawe Regency over the past two years, reinforcing concerns about the ecological and economic toll of ongoing pollution.

Aquaculture Production in 2022–2023

Type of Aquaculture	Konawe Regency		North Konawe Regency	
	2022	2023	2022	2023
Milkfish (Bandeng)	14,081 Tons	4 Tons	5,53 Tons	5,4 Tons
Shrimp (Udang)	17,076 Tons	567.352 Kg	1,973 Ton	1,570 Tons

Health Data: Surge in Respiratory Illness Cases Near Mining Zones

Several subdistricts in Konawe and North Konawe Regencies, both located within the mining-affected areas, have recorded the highest number of acute respiratory infection (ISPA) cases in Southeast Sulawesi.

Data from four community health centers, Motui Health Center, Matandahi Health Center, Morosi Health Center, and Sampara Health Center, reveal a startling surge in ISPA cases, underscoring the severe public health impact in regions surrounding mining and industrial operations.

Respiratory Infection (ISPA) Cases in Four Health Centers in Konawe and North Konawe Regencies					
Health Center	2019	2020	2021	2022	2023
Motui	-	-	-	63 cases	76 cases
Matandahi	-	286 cases	294 cases	198 cases	-
Morosi	-	-	704 cases	1.191 cases	880 cases
Sampara	441 cases	279 cases	381 cases	879 cases	253 cases

Muhadi, Head of Administration at the Motui Health Center, explained that most patients diagnosed with respiratory infections (ISPA) commonly report symptoms such as flu and coughing. He noted that both the weather conditions and the subdistrict's proximity to PT OSS's coal-fired power plant (PLTU) are contributing factors to the rising number of cases in Motui. Compounding the issue, the company's coal stockpile is also located near the area.

"Back in 2022 and early 2023, the dust situation was really concerning. Many housewives would complain, they had to sweep and mop their homes two to three times a day because black dust covered their furniture," Muhadi said. "So, the public perception is that the dust comes from coal. Sometimes the intensity is high, sometimes low, but it's unpredictable."

ISPA Cases by Age and Gender – 2023			
Age Group	Gender		Total
	Male	Female	
0 - 5 years	3	5	8
5 - 9 years	9	11	20
9 - 60 years	25	19	44
+ 60 years	-	4	4
Source: Motui Health Center			76

Weak Regulations and Inadequate Oversight

Ramadhan Tosepu, a lecturer at the Faculty of Public Health, Halu Oleo University (UHO) Kendari, voiced concern over the worsening environmental conditions in Morosi's mining-affected zones. "If we look at the location, there's no other significant source of pollution besides the coal-fired power plant. So, it's very logical to conclude that this pollution is caused by coal use," he stated.

One of the earliest and most visible impacts on residents, according to Ramadhan, is the sharp rise in acute respiratory infections (ISPA), which he described as a primary indicator of air pollution's immediate effects. Over time, the accumulation of dust and hazardous substances from coal combustion could significantly elevate the risk of various respiratory illnesses. "ISPA is the gateway, it's the first sign of deeper respiratory problems, such as lung damage," he explained.

To mitigate environmental damage and reduce ISPA cases, Ramadhan urged companies to seriously manage their fuel sources. He emphasized that coal and combustion waste should not be stored in open spaces, as coal dust can spread easily with minimal oversight. Additionally, emissions from power plants must comply strictly with environmental regulations. "There are actually environmentally friendly industrial models to follow, companies that have operated for decades without harming nearby communities," he added.

Meanwhile, Ibnu Hendro Prasetianto, Head of Environmental Compliance and Capacity Building at the Southeast Sulawesi Environmental Agency (DLH Sultra), acknowledged that his office, along with the Environmental Law Enforcement Directorate (Gakkum), had conducted monitoring activities at

PT OSS and PT VDNI. However, he clarified that oversight at the time was under the authority of the Ministry of Environment and Forestry (KLHK).

"Gakkum issued a formal report, but we haven't received any updates on follow-up actions, whether sanctions were imposed or not, we don't know for sure," he admitted.

Ibnu explained that regulatory supervision falls primarily under the jurisdiction of the Konawe Regency Environmental Office (DLH Konawe) and the Ministry. The provincial agency only provides support when requested. "In fact, since 2021, the Ministry has already issued sanctions, and in 2023 and 2024, follow-up monitoring has been carried out based on those sanctions," he said.

He emphasized that all enforcement and oversight responsibilities lie with the Ministry of Environment and the local DLH in Konawe. Any data regarding sanctions or enforcement outcomes is entirely managed by the Ministry.

Residents Take Legal Action

In an effort to halt the environmental and health impacts caused by coal use, WALHI and affected residents have filed a lawsuit, arguing that coal is the primary source of air pollution and environmental degradation in the region. Together with the People's Legal Aid Coalition – Morosi People's Advocacy (Koalisi Bantuan Hukum Rakyat - Advokasi Rakyat Morosi), the residents filed a civil lawsuit against PT Obsidian Stainless Steel (OSS) and PT Virtue Dragon Nickel Industry Park (VDNI-P) at the Unaaha District Court in December 2024.

The lawsuit names three parties as defendants: PT OSS, PT VDNI-P, and the Minister of Environment and Forestry. "This legal action is backed by independent laboratory tests showing contamination of hazardous chemical elements such as cadmium in local fish ponds and waters," WALHI stated.

Grounded in scientific data and on-the-ground evidence, WALHI and the residents are asserting their right to a healthy life and a liveable environment. The case remains ongoing and has entered its 15th court session to date.

A court session at the Unaaha District Court hears witness testimonies in the environmental pollution lawsuit against PT VDNIP and PT OSS, related to their operations in Morosi District, Konawe Regency, Southeast Sulawesi. (Photo: Courtesy)

In the 16th court session of the environmental pollution lawsuit against PT VDNIP and PT OSS, held at the Unaaha District Court on Monday, May 5, 2025, Prof. Andri Gunawan Wibisana, a professor of law at Universitas Indonesia (UI), testified as an expert witness. The case concerns allegations of environmental damage caused by the two companies' operations in Morosi District, Konawe Regency, Southeast Sulawesi.

According to Andri, pollution can be simply defined as the deterioration of environmental quality from a previously better state. To assess this, environmental quality is categorized using national water, air, and waste quality standards, ranging from Class I to Class IV. "Class I means water is clean enough for human consumption and aquaculture. Class II is no longer drinkable but still suitable for fish farming. Class III is unsuitable for activities like bathing or swimming but can still support aquaculture. Class IV means fish die, indicating the worst quality," he explained.

The mass death of milkfish in community ponds, he noted, indicates a significant decline in water quality. While laboratory tests are typically needed to confirm pollution, the visible environmental degradation, such as fish kills, already strongly suggests contamination. "Laboratory results strengthen the case but are not the sole proof. The fish deaths themselves are evidence of declining environmental quality," Andri stated.

He further explained that PT OSS and PT VDNIP may be held accountable for both written and unwritten legal violations. Written violations include exceeding water pollution thresholds and improper waste management procedures, which can be measured from discharge pipes leading into rivers. “Wastewater quality is measured at the discharge pipe, while river water quality is measured directly from the river. These are two distinct metrics," he clarified.

Unwritten violations, Andri argued, relate to human rights abuses, particularly when communities are excluded from the Environmental Impact Assessment (AMDAL) process. “Communities should be involved in public consultations. Their exclusion constitutes a violation of human rights," he emphasized.

He urged the court to hold the companies strictly liable and declare their activities harmful with widespread consequences. This, he said, would oblige the companies to compensate affected communities and restore the environment. “Restoration is critical, not just to fix past damage but to ensure future violations do not occur. The party responsible for pollution must also bear the cost of recovery. Otherwise, the burden falls on the people," he concluded.

As of this report, the defendants have yet to respond to the lawsuit. Attempts to reach PT OSS's public relations office via phone and WhatsApp have gone unanswered.

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Beneath the Dust: Daily Lives Silenced by Nickel

by Hasrianti

PT. Indonesia Pomalaa Industry Park (PT IPIP) Port Gate Post. (Photo by Hasrianti)

Dust swirls in the air from continuous excavation and landfilling at the loading dock of nickel mining company PT Indonesia Pomalaa Industry Park (IPIP). Local residents have begun to complain of persistent coughing and shortness of breath.

For two years now, Nasrum has not slept peacefully. The roar of excavators echoes through the night, disturbing the peace of his home located just 500 meters from the mining site in Lowina Hamlet, Oko-Oko Village, Pomalaa District, Kolaka Regency, Southeast Sulawesi. Heavy machinery owned by the China-based mining company works relentlessly, digging and filling land through the night.

But the daytime brings no relief. Nasrum's house lies directly along the route of IPIP's dump trucks. Each time one of the massive ten-wheeled trucks passes by, clouds of dust are kicked up into the air. The dust clings to his house's walls, coats every surface, and settles into every corner.

Inside, it's no different. Nasrum touches a table in the corner of his living room and lifts his finger to reveal a thick layer of dust, proof of the suffocating pollution creeping into his everyday life.

Nasrum, a resident affected by mining activities of PT Indonesia Pomalaa Industry Park (PT IPIP). (Photo by Hasrianti)

When met at his home, Nasrum's usually cheerful expression faded into resignation as he spoke about the daily torment caused by mining trucks. “Every day we breathe in sandy dust. If we sit on the porch, it clings to our bodies," he said.

The thick dust originates from the excavation of nearby hills, where PT Indonesia Pomalaa Industry Park (IPIP) is building a port for nickel loading and unloading. Heavy machinery operates constantly at the site, digging and dumping soil. A coal-fired power plant (PLTU) is also located within the same industrial complex.

Nasrum and fellow residents of Dusun Lowina have protested against the Chinese-owned Huayou Group's mining activities. But their voices seem to fall on deaf ears. “We've asked them to stop the activity, and they do, but once we're out of sight, they start again, often working late into the night," he said.

The poor air quality has led to chronic coughing for Nasrum, which he attributes to the dust and emissions from the mining site. “My family and I haven't gone to the health post yet, but maybe other families have," he admitted.

Ratna, a health cadre from the local sub-health center for children and the elderly, said her own home is also covered in thick dust. She called on the company to provide proper health education, not just distribute 10 kilograms of rice in compensation. “Yes, we need rice, but we also need materials and tools to protect our health. Our homes are filled with dust because of the mining activity," she said.

For Samsul Bahri, the impact has been even more severe. In addition to having his home blanketed in dust, his rice fields have been flooded with mud

due to upstream mining operations. Worse, his land has been taken over by the company to build a stockpile area. “I reported this to the village head, but it led nowhere. He claimed my land certificate was invalid, even though I've held it long before the company arrived,” Samsul said.

Samsul has held his Statement Letter of Land Ownership/ Surat Keterangan tanah (SKT)[16] since 1978, while IPIP's documents date from 1981. He has filed a complaint with the Southeast Sulawesi Police, but no action has been taken. “They went ahead and used my land, and that of other residents, for the company's hauling road and stockpile,” he added.

Hauling roads are specially designed routes in the mining industry for transporting heavy or bulk materials using large trucks.

Oko-Oko Village in Pomalaa District, Kolaka Regency, is one of Southeast Sulawesi's nickel mining zones. Spanning 333.82 square kilometers, it is home to 13 nickel mining concessions, including IPIP, one of Indonesia's designated National Strategic Projects (PSN).

Health Impacts on Local Communities

Poor air quality poses serious risks to human health, especially for those living near mining zones. According to Hakim Nur Mampa, Chairman of the Indonesian Medical Association (IDI) in Kolaka, the health of communities in mining areas is directly affected by both the extraction and processing of mineral ores. Hazardous exposures include physical factors such as dust, noise, and vibrations, as well as chemical factors like air emissions and heavy metals, including lead and other substances used during nickel ore processing.

As a result, residents near mining operations are at higher risk of developing respiratory illnesses such as acute respiratory infections (ISPA), chronic bronchitis, chronic obstructive pulmonary disease (COPD), heavy metal poisoning, and skin and eye diseases. Hakim emphasized that these risks could be mitigated through the adoption of environmentally friendly technologies and proper waste management.

“To reduce the health impacts of mining, the key step is strict law enforcement, something that has not been implemented effectively so far,” he asserted.

16 SKT refers to Surat Keterangan Tanah, a letter issued by the village head or subdistrict office as proof of land possession. While SKT can serve as a basis for applying for a land certificate, it is important to note that it is not a legally recognized proof of ownership.

Supporting this concern, health centers near mining sites have reported a rise in ISPA cases. The Pomalaa Health Center, for instance, recorded a steady increase in respiratory illness cases after the COVID-19 pandemic.

"During the height of the pandemic in 2020, people were afraid to visit health centers. But after COVID, the ISPA numbers climbed again as residents returned for check-ups when experiencing coughs or breathing problems," said Alriyani Hamzah, Head of the Pomalaa Health Center.

ISPA Cases at Pomalaa Health Center

2019	2020	2021	2022	2023	2024
2.249	2.249	3.887	890	2.012	2.979

Distribution of ISPA Cases in Pomalaa Subdistrict

No	Village/ Area	Number of ISPA Cases
1	Dawi-dawi	1.036
2	Pelambua	479
3	Huko-huko	294
4	Tonggoni	277
5	Tambea	250
6	Pesouha	186
7	Sopura	122
8	Hakatotobu	99
9	Pomalaa	92
10	Oko-oko	64
11	Kumoro	43
12	Totobo	37

Muhammad Aris, Head of the Kolaka Health Office, stated that acute respiratory infections (ISPA) are among the most common illnesses in Indonesia, and are especially prevalent in mining areas. "Whenever a mining company begins operations, we always advise them to conduct health screenings, such as lung check-ups," he said.

He added that the Kolaka Health Office is currently taking steps to mitigate health impacts in mining zones, particularly in the IPIP concession area in Pomalaa District and around PT Ceria's operations in Wolo District. "We are preparing to ensure that the health impacts caused by mining activities do not continue to spread," he affirmed.

Mining activities of PT Indonesia Pomalaa Industry Park (IPIP). (Photo by Hasrianti)

Andi Rahman, Executive Director of WALHI Southeast Sulawesi, has called on authorities to strengthen oversight and evaluation of mining operations in Pomalaa. “Mining areas consistently experience health disturbances among nearby residents, particularly related to respiratory issues," he stated.

Sultrakini.com attempted to contact PT Indonesia Pomalaa Industry Park (IPIP) regarding residents' complaints. However, IPIP's Environmental Supervisor, Stevani, said she was unavailable for comment. “I'm in Makassar and currently on leave," she replied when reached by phone.

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Torobulu's Dirty Trade: Clean Energy, Filthy Cost

by Nursadah K

Mining activities of PT Wijaya Inti Nusantara (PT WIN) take place right beside the football field in Torobulu Village, just about 100 meters from the main road. (Photo: Nursadah/Adaswara.com)

Located about 60 kilometers from Kendari, Southeast Sulawesi, Torobulu was once surrounded by lush hills and long coastlines, known for its rich marine and agricultural resources. With a population of around 2,000, the village thrived on fishing and seaweed farming, until the global demand for nickel reshaped its destiny.

Today, Torobulu has become part of the global supply chain for the energy transition. As the world moves away from fossil fuels like coal and oil, clean energy technologies such as electric vehicles and solar panels have surged in popularity, and nickel is a key component. This strategic metal is essential for producing longer-lasting EV batteries, energy storage systems, and thermal conductors for renewable technologies.

Southeast Sulawesi, including Torobulu, holds a significant portion of Indonesia's national nickel reserves. The region has drawn waves of investors, promising progress and a cleaner, greener future. But on the ground, the reality is starkly different.

Nickel mining in Torobulu began in 2001, with companies such as PT Integra, PT Billy, and PT Wijaya Inti Nusantara (WIN) operating in the area. PT WIN remains one of the most active companies today, holding a mining license over approximately 2,000 hectares. Residents once hoped this would bring prosperity. Instead, mining has brought destruction.

Farming and plantation lands have been damaged. The sea has turned murky with sediment, ruining fisheries and seaweed harvests. Hillsides have been stripped bare. Worse still, mining activity has encroached upon homes and schools. Without meaningful oversight or environmental evaluation, PT WIN continues to extract nickel unchecked.

Andi Firmansyah, a Torobulu resident, expressed frustration: “They say nickel is for clean energy, but all we see here is destruction and poverty."

Haslilin (32), a housewife and environmental advocate, voiced her fear for the village's future. “We no longer have the sea or gardens. If the mining stops, how are we supposed to survive?"

Young people share the same anxiety. Ayunia Muis, a local youth, sees a dark future ahead. “Most of our farming land is already taken by the mining companies. And our parents' livelihoods from the sea continue to decline," she said quietly.

What was once a self-reliant coastal village has now become a cautionary tale of how the race for “green" minerals can leave environmental and social ruin in its wake, unless justice and sustainability go hand in hand.

Ayunia Muis (Photo by Nursadah/ Adaswara.com)

Ayu, short for Ayunia, explained that many Torobulu residents have yet to fully grasp the long-term consequences of mining, as they are still able to earn a living working for the company. However, she pointed out that without realizing it, their true sources of livelihood have already been taken away by the mining industry.

“If the mining company leaves one day, what will we have left? Farming is no longer an option; our agricultural land has been taken. Fishing isn't viable either, the catch is no longer promising," she said.

Ayu believes the company should bear responsibility for restoring both the environment and the local economy. But so far, she added, PT WIN has done nothing substantial to fulfil that obligation.

“They pretend to do land reclamation, but afterward, they just dig it up again. It's meaningless,” Ayu stated.

Lack of Oversight, People Left to Fight Alone

The growing problems faced by the residents of Torobulu have drawn the attention of WALHI. According to the organization, the operations of PT Wijaya Inti Nusantara (WIN) have triggered a chain of social, environmental, health, and economic conflicts.

“We suspect that PT WIN's mining activities ignore environmental impact assessments and violate legal regulations, resulting in environmental degradation, air and water pollution, and damage to vital sources of livelihood such as fish ponds and the sea,” said WALHI Southeast Sulawesi Director, Andi Rachman.

Supported by WALHI, local residents, organized under the Alliance of Environmental and Human Rights Defenders of Torobulu, have staged multiple protests. Their demand is clear: put an end to PT WIN's mining activities, which they believe have become the root cause of the destruction in their village.

A protest by the Alliance of Environmental and Human Rights Defenders of Torobulu on Monday, February 2025. (Photo: Courtesy)

Despite relentless resistance, the efforts of Torobulu residents to fight back have yet to bear fruit. PT Wijaya Inti Nusantara (WIN) continues to operate freely without firm action from the authorities. “We're exhausted by this environmental destruction. PT WIN must stop operating in Torobulu," said Hermina, a member of the Alliance of Environmental and Human Rights Defenders of Torobulu.

She emphasized that PT WIN's operations clearly violate environmental regulations, yet there has been no serious evaluation or intervention from government institutions. “I deeply regret the lack of oversight by the responsible agencies in evaluating PT WIN's operations here in Torobulu," she added.

When contacted, PT WIN defended its operations, claiming that all activities are legal, compensation has been paid to the affected communities, and that they operate within a licensed mining area (IUP). The company also claimed to conduct regular land reclamation, community development programs (CSR), and prioritize local residents in employment.

“We would never operate without proper permits. We've contributed to the community through aid programs, bore wells, and food packages," said Kasman, PT WIN's public relations officer.

However, residents argue that these claims don't match the reality. They say reclamation is minimal, mining pits are reopened, and the environmental damage remains unaddressed. The fear of an uncertain future lingers.

What is happening in Torobulu reflects a stark paradox in the global energy transition: the world demands clean energy yet turns a blind eye to the dirty process of sourcing its raw materials. Nickel may power electric cars across the globe, but in its place of origin, it leaves behind destruction and despair.

The younger generation of Torobulu is also questioning their future. While global narratives boast of a sustainable future, their village bears the environmental cost.

“We've lost our livelihood. Our parents no longer fish, and our land has been excavated. All we can do is ask, what will be left for us?" said Ayu.

This article was originally published by *adaswara.com* on April 30, 2025, and can be accessed via the following link:

https://adaswara.com/torobulu-jadi-kotor-demi-energi-bersih/

PART

II

Energy Transition at the Cost of Crops and Catch

Siti Sulbiyah Kurniasih

West Kalimantan

Pontianak Post

I'm Siti Sulbiyah, a journalist at *Pontianak Post* in West Kalimantan. I cover a range of issues, from economic shifts and environmental challenges to lifestyle trends, driven by a commitment to field reporting and data-supported storytelling. I aim to deliver journalism that is both relevant and impactful for readers.

The Cost of Transition: Deforestation and the Disappearance of Food

by Siti Sulbiyah Kurniasih

Farmland in Jungkat Village, Mempawah Regency, remains submerged. The area is grappling with ecological issues that cause prolonged waterlogging on agricultural land.
(Photo by Siti/Pontianak Post)

Once a vital source of livelihood, the rice fields of Wajok Hilir Village in Jongkat Subdistrict, Mempawah Regency, West Kalimantan, have now faded into memory. Hundreds of hectares of productive farmland have become overgrown with wild grass, a situation that has persisted for the past several years.

These fields were once the backbone of local food supply and economy. Today, they lie barren, no longer producing crops for the people.

"This area used to be 500 hectares of rice fields, nothing else grew here," said Hendi Sumaryo, a Wajok Hilir resident, in an interview with Pontianak Post in late March 2024.

Hendi, once a dedicated farmer, no longer works the land. Like many others in the village, he abandoned farming after crop yields plummeted.

Persistent waterlogging has made the soil unproductive, with many plants failing to grow at all.

Before 2021, despite recurring floods, the harvests were still manageable, one hectare could yield up to three tons of rice. But since then, output has dropped dramatically. Hendi estimates that only about 40 hectares of farmland remain active, while the rest has become idle.

Worsening hydrological conditions have exacerbated the problem. “Even one night of rain can flood the fields,” he said. “It used to drain quickly, but now the water just sits.”

Farmers have tried to replant, but seeds often rot under standing water before they can sprout. “Sometimes we've already cleared and prepared the fields, only to see them flooded again within a week. Then we have to wait forever for them to dry,” Hendi added.

He believes the root of the problem lies upstream. The conversion of forested areas into monoculture plantations, he said, has had indirect but damaging effects.

Wajok Hilir sits between two rivers: Sungai Air Hitam and Sungai Peniti. Several concession-holding companies operate nearby, including PT Muara Sungai Landak (MSL), which holds a 13,000-hectare license (IUPHHK-HTI No. 243/Menhut-II/2012). The area also includes oil palm plantations under PT Mitra Andalan Sejahtera (MAS).

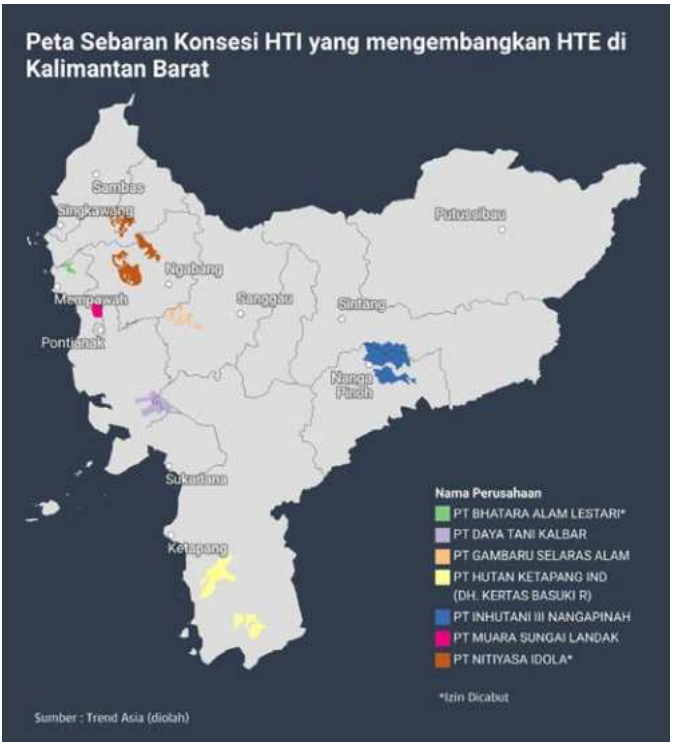
According to a report by Trend Asia titled “*Profiteers of the Energy Transition,*” 85% of PT MSL's concession area has been designated by the Ministry of Environment and Forestry (KLHK) as protected peatland. Nevertheless, the ministry has still listed MSL as a developer of forest-based energy plantations.

The national energy transition, framed as a shift from fossil fuels like coal to renewable energy sources such as biomass and co-firing, is fueling this trend. Under the guise of clean energy, forest concessions granted through the Industrial Plantation Forest (HTI) scheme are now being used to build energy plantations (HTE). While aiming to reduce carbon emissions, the policy risks triggering new environmental problems. Deforestation of natural forests looms large as demand grows for wood sourced from these HTE zones.

Trend Asia reports that seven HTEs have been established across West Kalimantan, all operated by companies with existing HTI licenses. These include: PT Muara Sungai Landak in Mempawah (13,000 ha), PT Hutan

Ketapang Industri in Ketapang (100,150 ha), PT Gambaru Selaras Alam in Sanggau (20,445 ha), PT Inhutani III Nanga Pinoh in Melawi (119,080 ha), PT Bhatara Alam Lestari in Mempawah (7,100 ha), PT Nityasa Idola in Sanggau (113,196 ha) and PT Daya Tani Kalbar in Ketapang (56,060 ha)

Combined, these concessions represent a total potential area of 429,031 hectares, a massive footprint in the name of renewable energy, but one that may come at the cost of local livelihoods and food security.



Distribution of Industrial Plantation Forest (HTI) Concessions Developing Energy Plantations (HTE) in West Kalimantan. Source: Trend Asia (compiled).[17]

17 This map shows the distribution of Industrial Plantation Forest (HTI) concessions in West Kalimantan that are developing energy plantations (HTE), which are tree plantations intended to supply biomass for energy production. Some companies shown on the map, such as PT Bhatara Alam Lestari, have had their permits revoked. The expansion of HTE has raised environmental and human rights concerns, especially related to land rights, deforestation, and impacts on indigenous communities.

Ahmad Syukri, Chair of Advocacy and Research Circle/ Lingkaran Advokasi dan Riset (Link-AR) Borneo, noted that while plans to develop energy plantations for biomass have been set in motion, very few are actually operational on the ground. In fact, some companies' permits have already been frozen.

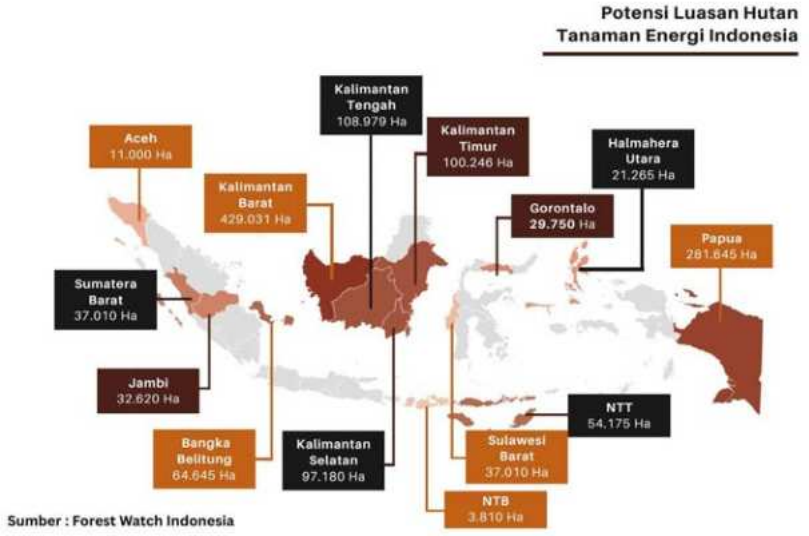
Even so, Syukri warned that the mere existence of these permits poses potential environmental risks. "The same permits are being repurposed, some areas are designated for pulp and paper, while others are redirected for biomass, as is the case with PT MSL," he explained.

The wood harvested from these energy plantations is intended to fuel co-firing programs in coal-fired power plants (PLTU) and supply biomass power plants (PLTBm) across West Kalimantan. Among the PLTUs targeted are those in Sintang, Ketapang, Bengkayang, and Sanggau. Biomass power plants include PLTBm Harjhon Timber, PLTBm Suka Jaya Makmur, PLTBm Rezeki Perkasa Sejahtera Lestari (RPSL), and another unit also operated by Suka Jaya Makmur.

Syukri further explained that some industrial forest (HTI) companies are now diversifying their operations to align with government policy shifts and position themselves closer to emerging markets. For biomass plants (PLTBm), many companies now focus on supplying wood chips or wood pellets, making production more localized and efficient.

As a result, many HTI concessions geared toward pellet production are located near existing power plants. One example is PT MSL, situated in Wajok Hilir, Siantan Subdistrict, Mempawah Regency.

According to Forest Watch Indonesia (FWI), the development of energy plantations (HTE) in Indonesia has already contributed to the destruction of 55,000 hectares of forest. Additionally, 420,000 hectares of natural forest within 31 concession areas are at risk of deforestation. In total, Indonesia's HTE potential spans approximately 1.29 million hectares, with 31 companies committed to developing biomass and bioenergy plantations, raising serious environmental and ecological concerns.



Potential land area allocated for energy plantation (HTE) across Indonesia.
Source: Forest Watch Indonesia

The energy plantation (HTE) trend isn't limited to West Kalimantan. According to data from Forest Watch Indonesia (FWI), large-scale deforestation risks also threaten other provinces: 108,979 hectares in Central Kalimantan, 100,246 hectares in East Kalimantan, and 97,180 hectares in South Kalimantan, all linked to energy projects.

Yet, according to Ervan Judiarto, Head of Forest Planning and Management at the West Kalimantan Environment and Forestry Office (DLHK), there is currently no specific permit category issued solely for energy plantations. Of the 64 forestry permits issued in the province, they fall into three main categories: industrial forest plantations (HTI), natural forest utilization, and ecosystem restoration.

"For energy crops specifically, there are none," Ervan confirmed.

Energy plantations, he explained, are covered under broader permits, such as the Forest Timber Product Utilization Permit for Plantation Forests (IUPHHK-HT)[18] . West Kalimantan's current role is more as a supplier of raw timber, which is then transported outside the province for processing.

18 IUPHHK-HT stands for Izin Usaha Pemanfaatan Hasil Hutan Kayu Hutan Tanaman or Forest Timber Product Utilization Permit for Plantation Forests. IUPHHK-HT is a type of permit in Indonesia related to the utilization of timber from plantation forests for industrial purposes.

Until now, the biomass and co-firing sectors have relied mostly on wood waste, such as rubber trees, logging byproducts, and forest residues. If companies like PT MSL begin producing biomass from energy crops, Ervan believes the volume will still be relatively small.

He noted that PLN (Indonesia's state electricity company) had once requested a list of companies capable of supplying wood chips, but West Kalimantan's supply capacity remains limited.

In terms of planning, the provincial government is currently focusing on boosting roundwood productivity and strengthening carbon trading mechanisms as part of its forest resource management strategy.

"West Kalimantan is not a priority area for the energy plantation program," Ervan added.

While the potential exists, he acknowledged, wood pellet production as an alternative energy source remains far from widespread in the province.

Pontianak Post attempted to contact PT MSL for comment, but as of the afternoon of Saturday, April 26, no response had been received.

Food Security at Risk as Farmlands Sink

Flooding of agricultural lands is taking a serious toll on local food security. Inundated fields have rendered many farmers' lands unusable, with crops failing even before the seeds are planted.

The issue is not confined to Wajok Hilir, neighboring Jungkat Village is experiencing similar hardships. The village, which borders an energy plantation concession, has suffered repeated waterlogging on its farmlands.

Munawaroh (45), a resident of Jungkat, said farming has become nearly impossible over the past five years. "A little rain and the land floods. Even after applying fertilizer, it floods again," she said.

She recalled preparing to plant rice over a one-hectare plot in November 2024. The land had been cleared, but heavy rain caused persistent flooding, forcing her to abandon the effort.

"The seeds couldn't be stored, so they went to waste," she added, estimating her loss at around Rp 500,000, a devastating figure for her household.

Farmland in Jungkat Village, Jongkat Subdistrict, Mempawah Regency remains submerged. The area faces ongoing ecological issues that cause frequent and prolonged waterlogging.(Photo by Siti/Pontianak Post)

Murakip (48), head of the Bina Usaha farmer group in Jungkat Village, recalls a time when he never had to buy rice. Nor did he need to purchase coconut milk, coconut trees once thrived in abundance across their farmland.

But those days are gone. Widespread damage to their agricultural land has made it difficult, even impossible, to grow a variety of food crops. Key commodities such as coconut, areca nut, and others have withered, while traditional staples like rice, corn, and taro have suffered repeated failures.

"As a farmer group leader, it's embarrassing to admit I now buy rice. I should be harvesting it myself," he said.

Murakip and his wife now rely on their taro chip (*stik keladi*) business, once a local favorite more than a decade ago. Back then, production could run daily thanks to an abundant taro supply and strong market demand.

Today, however, that business is in decline, crippled by a steep drop in taro availability. Murakip explained that production has fallen sharply since the COVID-19 pandemic. Now, he can only produce taro chips a few times a year.

Even during this year's Eid holiday, only 500 kilograms of taro could be harvested and processed, yielding less than 100 kilograms of taro chips. This figure is drastically lower than previous years.

"Last year, we were able to process up to seven tons of taro and produce around 500 kilograms of chips," he added.

The declining supply is directly tied to repeated crop failures. The farmland remains flooded for extended periods, preventing plants from taking root and cutting off what was once a reliable food and income source.

Hendi, a resident of Wajok Hilir Village, Jongkat Subdistrict, Mempawah Regency, points to one of the few remaining rice fields in the area. (Photo by Siti/Pontianak Post)

According to Ahmad Syukri, one of the most visible impacts of deforestation is the loss of local food sources, something clearly evident in Wajok Hilir and Jungkat villages in Mempawah Regency. "This directly contradicts President Prabowo's Asta Cita vision for national food security. The fact that land in these two villages is no longer cultivable shows that the impact isn't just environmental, it's deeply economic," he said.

Syukri explained that forest areas once served as crucial water buffers. Now, they've been replaced by monoculture plantations, leading to the collapse of ecological resilience and increasing the risk of natural disasters like flooding. "Forests used to support a diverse ecosystem. Today, they've been replaced with a single species of tree. That clearly changes the function of the landscape," he stressed.

Murakip points to a garden area once filled with thriving coconut trees. Many of the trees are now damaged or dead. (Photo by Siti/Pontianak Post)

Electricity for Business and Industry Owners

According to the Electricity Supply Business Plan (RUPTL), projected electricity sales in West Kalimantan are expected to rise across all customer segments from 2021 to 2030. The industrial sector leads with the highest growth rate at 318%, from 228 GWh in 2021 to 953 GWh in 2030.

The business sector follows with an 85% increase, from 598 GWh in 2021 to 1,116 GWh in 2030.

This data, said Ahmad Syukri, reflects that electricity consumption growth is primarily allocated to industry and business, not households.

"If this is what we call energy transition, yet it's unjust, then who is truly benefiting?" he questioned.

He criticized how current energy allocations are being used to support extractive industries such as palm oil mills and mining smelters, which he argued damage the environment and violate community rights.

"This deviates from the principles of an energy transition that should serve as a solution to the climate crisis," he said.

He added that programs like co-firing and biomass, initially intended as solutions to the energy crisis, have now turned into commercial commodities that no longer prioritize the public interest.

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https://pontianakpost.jawapos.com/features/1465931705/dampak-proyek-transisi-energi-deforestasi-hingga-kehilangan-sumber-pangan

Muhammad Israjab

Southeast Sulawesi

TribunnewsSultra.com

Let me introduce myself, my name is Muhammad Israjab, a journalist from Kendari City, Southeast Sulawesi. I work for *TribunnewsSultra.com*, part of the TribunNetwork media group.

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ALIANSI JURNALIS INDEPEN

Smelter Plants, Dead Seas: The Suffering of Coastal Fishers and Farmers in Konawe, Southeast Sulawesi

by Muhammad Israjab

A view of a resident's fish pond in Lambuluo Village, Motui District, North Konawe Regency, Southeast Sulawesi. The area is located near the industrial smelter zone operated by PT Virtue Dragon Nickel Industry (VDNI) and PT Obsidian Stainless Steel (OSS) in Morosi District, Konawe Regency, Southeast Sulawesi. (Photo by Muhammad Israjab)

Fishermen and fishpond farmers in Konawe and North Konawe Regencies, Southeast Sulawesi (Sulawesi Tenggara/ Sultra), say they are feeling the adverse effects of the nickel smelting operations of PT Virtue Dragon Nickel Industry (VDNI) and PT Obsidian Stainless Steel (OSS). Both smelters, located in Morosi District, Konawe, have been designated as National Strategic Projects (Proyek Strategis Nasional/PSN) under the third amendment to Presidential Regulation No. 3 of 2016.

Rather than driving local economic growth, these projects have brought new problems, most notably, water pollution allegedly caused by industrial activity from the smelters.

Rakmin, a 62-year-old fisherman from Lambuluo Village in Motui District, North Konawe, has experienced the toll firsthand. The proximity of the smelting plants to his coastal village has affected his primary livelihood as a fisherman. Once able to rely on a bountiful sea, his catch has declined drastically.

He used to operate four boats, but now only one remains. “In the past, casting a single net was enough to provide for the day's meals," he recalled. “Now, even securing fish for daily food is hard, let alone selling any."

The fishing grounds in Motui lie close to the jetty of the smelting plant in Morosi. Rakmin also noted the impact of coal dust, which intensifies whenever the plant is active. “We used to collect rainwater for drinking, but now we can't. Dust sticks to everything, this table here gets coated again just minutes after cleaning," he said when met in March 2025.

Rakmin added that various fish species, such as rabbitfish (ikan baronang) and lobsters, once common in the area, have nearly vanished. “We used to catch 10 to 20 kilograms. Now, catching even two fish is a blessing," he said. “Crabs used to be plentiful during nighttime fishing too."

Not just marine life, but his crops have also suffered. Coconut and cashew trees no longer bear fruit. “It's likely the coal dust again. The seawater turns black. When I pull up the net, it's black within minutes," he lamented.

Despite the losses, Rakmin said there's been no support from the companies or local authorities, not even fishing gear or boat engines.

One of the fishing boats in Lambuluo Village, Motui District, North Konawe Regency, Southeast Sulawesi, has been left idle for an extended period. It can no longer be used following a drastic decline in fish catch along the Motui coast, which residents attribute to suspected pollution. (Photo by Muhammad Israjab)

"Other villages received assistance, like boat engines and fishing gear such as nets," Rakmin said.

Meanwhile, Rakib (47), a fish and shrimp farmer in Lambuluo Village, Motui District, echoed similar concerns about the impact of mining operations in Morosi. From his shrimp ponds, he can clearly see the smokestacks of the nickel smelters. The roar of the machinery is a constant background noise.

Rakib manages 7 hectares of shrimp ponds, but lately, the growth of his vannamei shrimp has been stunted. Despite applying fertilizers meant to generate plankton, the shrimp's natural food source—and to enrich the soil, production has been slow.

"Usually by two months they reach 100 grams, but now it's almost two months and there's barely any progress," he lamented.

He also noted a decline in water quality compared to before the mining operations began. In fact, he now relies on rainwater to fill the ponds to avoid contamination.

"It may already be mixed with waste," he said.

In a single harvest, Rakib used to collect 400–500 kilograms of shrimp. But now, despite the same quantity, the quality has dropped, and the shrimp fetch a low price at the market.

"It's usually sold for Rp30,000 per kilo. Thankfully, buyers still take them, even though the size is small. And to make it worse, fertilizers for pond enrichment are now hard to find," he added.

Rakib, like Rakmin, feels powerless to demand action from either the government or the companies.

"Many people have complained, but what can we do? These are big corporations," he sighed.

What worries him more is the news of another mining company planning to open new land in the area. Fearing further losses, Rakib is considering selling his pond.

"I might as well sell this pond. Another company is coming in. Most of the surrounding land has already been sold, only a few of us are still holding on," he said, pointing toward the plots he plans to sell.

Hundreds of Millions Lost in a Single Harvest

The condition of one of the ponds near the smelter factories of PT Virtue Dragon Nikcel Industri (VDNI) and PT Obsidian Stainless Steel (OSS). (Photo: Mihammad Israjab)

Anas (31), a resident of Tani Indah Village in Kapoiala District, Konawe Regency, has also felt the toll of the mining operations. He believes the so-called National Strategic Project (PSN) has caused significant losses for locals.

"In the Morosi Industrial Area, the impact on the community varies, from aquaculture and capture fisheries to rice and copra farming. We can say the yields are almost gone now," he said.

Anas recalls that 2014 marked the beginning of the fisheries' decline. That year, residents gave up their ponds and farmlands to make way for the development of PT Virtue Dragon Nickel Industry (VDNI) and PT Obsidian Stainless Steel (OSS).

"During the development stage in 2014, some land was acquired, and now we can see many former ponds and agricultural lands have become unusable. Even the seaweed farmers along the coast have been affected," he said.

Once-productive ponds have since lost their function. Instead of bringing economic growth, they now create problems, not only in agriculture and fisheries but also in public health.

“We have to admit, there's been a decline in the local economy, especially for shrimp farmers near the mining sites. Many have sold or had their land acquired by the company," he explained.

Anas used to earn a profit every harvest. Now, he's operating at a loss. The total cost, from land preparation to production, has reached more than IDR 400 million. This includes expenses for renting heavy machinery, purchasing seeds, pesticides, and fertilizers.

“Renting heavy equipment for 25 hours costs IDR 17.5 million. Lost yields, like 1,000 kilograms of milkfish worth IDR 75 million and 400 kilograms of vannamei shrimp worth IDR 66 million, bring the total loss to IDR 409.45 million," he estimated.

Tani Indah and other areas in Kapoiala District used to be among the top contributors to fisheries production in Konawe. Now, due to widespread land conversion, the area has lost its productivity.

According to Anas, residents are no longer producing fish or shrimp, they now buy it for their own daily consumption.

“We used to be major suppliers of fish, as recently as 2018. It used to benefit the region. Now it's the opposite, we're the ones buying fish," Anas said.

Lukman (46), a fisherman from Morosi, was spotted preparing his net along the Motui coast. He expressed frustration at the increasingly elusive fish. On that scorching midday, species like milkfish and mullet, once commonly caught, were nowhere to be seen.

Just off his boat, coal barges loomed near the shoreline, anchored beside the jetty of the smelter company.

“This is how it is now. I'm just trying to make a living, but the fish aren't there anymore. The mining probably has something to do with it," Lukman said, glancing at the row of coal vessels.

Residents have dealt with the impacts for years. The construction of the port, for example, has led to sediment buildup and murky waters.

“Our fishing spots have become shallower. The water is cloudy and black, and sometimes even muddy," Lukman explained.

Even catching mullet, a previously easy task, has become a struggle. On a lucky day, he might return with ten fish.

"When I pull up my net, it turns black. I don't even know why. As long as I catch something today, I'm already grateful," he said.

"It's getting harder for village fishers, especially along Lambuluo's coast. The water is visibly eroding and getting shallower," he added.

Declining Water Quality

WALHI (the Indonesian Forum for the Environment) Southeast Sulawesi has raised concerns over the environmental and social impacts of smelter plants operating in Konawe Regency, stating that the presence of these industrial giants has drastically altered local ecosystems and livelihoods.

PT Virtue Dragon Nickel Industry (VDNI), operating since 2014, constructed a nickel smelter plant in 2017 and began full operations in 2019. Occupying 700 hectares, the facility produces 800,000 tons of Nickel Pig Iron (NPI) annually with a nickel content of 10–12%.

To support its operations, VDNI built eight coal-fired power plants (PLTU) with a combined capacity of 30 MW, consuming 180,000 tons of coal annually. According to WALHI, waste from coal combustion, suspected of containing sulfur dioxide (SO), along with hazardous liquid waste, has been released into the environment, potentially contaminating local rivers.

WALHI's investigations reveal that since the smelter's operations began, shrimp and fish ponds in villages such as Labota, Tani Indah, Lalimbue, and Kapoiala Baru have been affected by coal ash contamination. These areas were once the backbone of Konawe's aquaculture industry, producing crab, shrimp, and milkfish. Today, production is in steep decline.

In 2024, WALHI initiated laboratory tests that detected dangerous levels of heavy metals in the hot wastewater discharged by PT Obsidian Stainless Steel (OSS). Cadmium levels reached 0.0977 mg/L, nearly 10 times the acceptable threshold of 0.01 mg/L. Copper content stood at 0.0485 mg/L, more than double the permissible limit of 0.02 mg/L.

Excessive cadmium poses a serious threat to aquatic organisms, impairing respiration and reproduction. In humans, prolonged exposure can lead to liver and kidney failure.

WALHI further asserted that the company's activities have caused widespread destruction of aquaculture ponds in the aforementioned villages, areas known for their premium seafood commodities. In 2018, Konawe's aquaculture output was recorded at 40,356 tons, according to the Central

Statistics Agency (BPS). Since then, production has steadily declined in line with the smelter's expansion.

WALHI Southeast Sulawesi Executive Director Andi Rahman explained that while nickel production in Morosi is marketed as a key input for electric batteries, the majority is still used for stainless steel.

"Based on our research, most of Indonesia's nickel ends up as stainless steel, mainly for Chinese cutlery, rather than electric batteries. Roughly 70% goes to stainless steel and only 30% for battery production," said Andi.

From an economic standpoint, the smelter's impact has been devastating for local communities. Farmlands and fisheries have deteriorated, reducing incomes and forcing career shifts.

"Residents' incomes have dropped. Fishermen, shrimp farmers, and crop growers have seen their economic sources contaminated by coal-fired power plants," he added.

WALHI maintains that the government's nickel downstreaming program has failed to deliver on its promise of community welfare, especially for those living near mining zones.

"It's not a path to prosperity, it's contradictory. Even without WALHI's data, BPS Sultra shows that poverty rates are rising in mining areas," said Andi.

He cited North Konawe (Konawe Utara/Konut) and Konawe as examples of regions with rising poverty, despite their vast natural resource wealth. North Konawe, in particular, holds some of Southeast Sulawesi's largest nickel reserves.

"Our studies estimate that the nickel reserves could be depleted by 2030. If that happens, what will become of these mining regions? We're facing long-term ecological damage," he warned.

Once dominated by aquaculture farmers, many locals have been forced to abandon their ponds and seek alternative livelihoods.

According to Konawe Fisheries Extension Officer Jhonny, water quality in Morosi has deteriorated significantly, making it unsuitable for aquaculture.

"Studies have confirmed the water is polluted. Farmed milkfish, for example, are stunted in growth. Even if we simulate ways to normalize the water, it won't work as long as the factory operates," he said.

Konawe Fisheries Agency Head Andrias Apono admitted that his office now only focuses on inland fisheries, including ponds.

“We must admit, the presence of nickel and coal industries has forced ponds to change function," he said.

Despite the worsening conditions, the local government seems powerless to intervene.

“So far, we've only managed to conduct public outreach. We haven't yet inventoried this year's affected fishermen or ponds, or tracked land use changes," Apono added.

In response to accusations that the company has discharged wastewater into rivers, PT OSS spokesperson Bahar denied the claims.

“We have a designated disposal system within the facility. Nothing is discharged directly into the river," he said briefly.

Renewable Energy (EBT)

Academician from the Faculty of Fisheries and Marine Sciences at Halu Oleo University (UHO), La Ode M. Aslan, stated that mining activities, particularly nickel mining, have brought about serious problems such as environmental degradation both on land and at sea.

For farmers and fishers, the constant threat of crop failure and difficulty in fishing is a daily reality. “The fundamental weakness is that while we acknowledge the sea covers 70% of our territory, we haven't truly harnessed what it offers. What kind of bioenergy can we extract from the ocean? This is an area we have yet to explore. Biogas is one potential we could develop in the future," said Aslan.

He urged for forward-thinking solutions to be considered by both the government and investors in terms of renewable energy development. For instance, there is a hydro energy potential of 6,340 gigawatts (GW) in conjunction with South Sulawesi, as well as minihydro and microhydro energy reaching 301 megawatts (MW), solar energy at 3,917 GW, wind energy around 1,414 GW, and geothermal energy at 318 MW.

The UHO academic suggested that the government should shift its focus to this sector instead of relying on coal, which is not only finite but also environmentally damaging.

"I see no strategy from the government. We're still indulging in coal, dirty energy," he said.

According to Prof. Aslan, the government has yet to show meaningful effort in developing new renewable energy sources. Its current direction still prioritizes maximizing revenue from mining. "Is there any serious study on mining and its risks, floods, death, analyzed through a fair economic balance? Compare that, for example, with development in the agricultural or agro-complex sectors," he emphasized.

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https://sultra.tribunnews.com/2025/05/05/pabrik-smelter-laut-yang-mati-derita-nelayan-dan-petambak-di-pesisir-konawe-sulawesi-tenggara

Niken Dwi Sitoningrum

East Kalimantan

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East Kalimantan's Silent Cry: The Irony of an Energy Village

by Niken Dwi Sitoningrum

For over 30 years, Marwati, an Indigenous Paser woman living in RT012, Rangan Village, Kuaro District, Paser Regency, East Kalimantan, has lived without electricity, despite residing in a province dubbed the national energy hub. The establishment of Indonesia's new capital, Ibu Kota Negara Nusantara (IKN), right next door hasn't changed her fate.

Marwati prepares the flashlights that serve as her home's primary source of light. (Photo by Niken Sitoningrum/Mongabay Indonesia)

On a cloudy afternoon in mid-April, Marwati looked to the sky. The sun, her only source of power, was hidden. She relies on a small solar panel to light a single three-watt bulb at night. During the rainy season, darkness is constant and worrisome. "If there's no sun, the light dims. At night, we just use flashlights," she said, pointing to five torches lined up, each with different battery capacities.

Whenever she visits the market, Marwati prioritizes buying batteries over food. To her, darkness isn't just discomfort, it's fear, and even danger.

Karyadi, her neighbor, faces the same reality. He also uses a 30 Watt Peak (WP) solar panel, granted by the government during the COVID-19 pandemic in 2022, to power a single bulb. "It only lasts for one light, and even then not more than 12 hours," he said.

Their homes sit just 140 kilometers from the new capital, in Indonesia's top coal-producing province. Paser itself ranks among the top three coal concession holders in the country. One major player, PT Kideco Jaya Agung (KJA), operates over 45,000 hectares of coal mining, with around 30% of its output used to power the national grid.

According to East Kalimantan's Long-Term Development Plan (RPJP) 2025–2045, the region, together with North Kalimantan, has an electricity surplus of 114.878 megawatts, enough to light approximately 80,000 homes consuming 1.54 kilowatts (KW) daily. Yet not a single kilowatt reaches Marwati or Karyadi.

In The Shadows of Power: Inequality in Plain Sight

Electricity poles stand tall outside the homes of Marwati and Karyadi in Rangan Village, Paser Regency, East Kalimantan. Power lines from Indonesia's State Electricity Company (PLN) stretch across their yards, but not a single kilowatt reaches their homes.

Ironically, PLN workers often ask Karyadi for permission to trim his palm fronds so they don't interfere with the cables, cables that never power his lights.

Electricity began flowing into Rangan Village in 2019, but not all residents benefit. "I don't even know what that thing is for, because I don't get any electricity," Karyadi told *Mongabay*.

Their homes are not tucked deep in the forest. In fact, they are just six kilometers from the main road connecting Paser Regency and the new capital region (IKN). Even more ironic, the Kuaro power substation is located just seven kilometers away, closer than the well-lit dormitories of coal mining workers.

"Maybe we villagers just lose out when it comes to money. These companies, they're heavyweights with big profits. Us? We struggle just to make ends meet," Karyadi said.

In 2019, both he and Marwati applied to get electricity connected to their homes. Years later, that dream remains out of reach. The problem? Cost. The cable connection from the substation would cost around IDR 17 million (roughly USD 1,100), a sum they simply can't afford, especially with additional fees for the meter.

PT Madhucon Pasir Makmur (MPM), one of 26 active coal mining license holders in Paser, operates just down the road. Its parent company, Madhucon Projects Ltd., is a large conglomerate from India with other mining ventures in South Sumatra.

According to Indonesia's Ministry of Energy and Mineral Resources, East Kalimantan holds 38% of the country's coal reserves, about 11.59 billion tons, and operates 26 coal-fired power plants (PLTUs). Yet electricity still fails to reach thousands of families like Karyadi's.

Provincial Energy Department data show 110 villages across six regencies/cities in East Kalimantan remain off the grid, affecting over 12,000 households, most of them in West Kutai (Kutai Barat). In Paser alone, six villages, including Rantau Layung, Selengot, and Harapan Baru, are still without PLN electricity.

"We still have 110 villages with no electricity," said Mashur Sudarsono Wira Adi, Head of Electricity at the East Kalimantan Energy and Mineral Resources Office. "We'll focus on reaching those in the next three years. If there's budget left, we'll move to remote hamlets. But for now, our priority is building distribution lines to villages."

For now, families like Marwati's must continue to fight the darkness, living just kilometers from power plants and coal mines, but still waiting for the light.

Number of Villages Without PLN Electricity Access in East Kalimantan. Source: East Kalimantan Energy and Mineral Resources Office (ESDM Kalimantan Timur).

Energy Justice?

For the past five years, Marwati and Karyadi have felt the critical need for electricity in their homes, not just for daily needs but for their safety. Without electricity, Marwati spends her nights in fear.

Wild animals and unknown individuals frequently disturb the area. At times, their livestock are killed, either shot or eaten by snakes. “It gets scary at night. I'm afraid of snakes, and I'm also afraid of people. You never know what people are capable of. There was a time when someone knocked on the door in the middle of the night," Marwati recalled.

The solar panel assistance they received from the government in 2022 brought partial relief, but it was half-hearted. No training on usage or maintenance was provided. “We installed it ourselves. They just gave it to us and we followed the guide," said Karyadi.

Marwati longs for a stable source of electricity at home. “We often go fishing in the river, but we can't store the fish in a freezer or keep ice to preserve it. We don't have a fridge. It's tough. I just want to have a light."

Beyrra Triasdian, Program Manager and Renewable Energy Campaigner at Trend Asia, says Marwati and Karyadi are living proof of the energy injustice in East Kalimantan. Prosperity should be shared equally, and electricity is a basic human need.

“In cases like this, it's clear that PLN is unfairly shifting the burden of grid connection onto citizens," Beyrra criticized.

Ironically, this isn't just happening in Kalimantan. Similar stories are found across resource-rich regions such as Sumatra, Sulawesi, and Papua. “Everyone should have equal access and the same opportunities to improve their well-being," she emphasized.

Echoing Beyrra's sentiment, Happy Aprillia, Head of the Integrated Laboratory Unit at Kalimantan Institute of Technology, said it's unjust for PLN to demand additional payment from citizens to cover connection and distribution costs. Even if there are additional charges, she argued, these shouldn't be shouldered by the public.

“PLN has a responsibility to provide electricity based on customer demand," she told Mongabay.

Mashur Sudarsono, Head of Electricity at the East Kalimantan Energy and Mineral Resources Agency, acknowledged that if the distance from a low-voltage pole to a house exceeds 60 meters, extra fees may apply. However, he believes PLN must also consider the financial capability of the residents.

“Usually, PLN asks for payment for the pole and cables. The amount isn't typically too high. But still, we have to ask, can the person afford it?" he said over the phone.

He added that the government is currently focusing on electrification programs for villages that remain off-grid. This year, the agency aims to reach 25 villages in five districts and cities, with the goal of achieving 100% electrification in East Kalimantan by 2027.

Marwati's house remains without electricity to this day, despite power lines running directly above its roof. (Photo by Niken Sitoningrum/Mongabay Indonesia)

Community-Based Solutions

The gap in electricity access in Indonesia's energy-rich regions is glaring. According to Beyrra Triasdian, the government must decentralize energy systems to address these inequalities, empowering communities to harness local renewable energy sources. Funds from energy transition schemes or climate crisis mitigation efforts could be channeled directly to residents to help move away from fossil fuels.

"Communities with renewable energy potential, those with access to small rivers or abundant sunlight, should be supported to develop their own systems. That's why decentralization matters. Let them manage it independently," Beyrra emphasized.

Still, Mashur Sudarsono, known as Sony, argued that a full energy transition isn't yet viable. He claimed the output from renewable sources doesn't compare to that of coal.

"We initially focused on solar power for remote and underdeveloped areas. But we realized solar isn't efficient, the output is too low. That's why, from 2023, we shifted back to expanding the main grid," he explained.

However, Happy Aprilia disagreed. She believes solar energy is the most feasible renewable source for all of East Kalimantan. Off-grid solar systems, with or without batteries, can be deployed even in the most isolated areas. But government backing is crucial.

"Without support from local governments to push PLN, requests from just two citizens are unlikely to gain attention," she noted.

Beyrra stressed that the priority right now is not just transitioning to clean energy, it's ensuring equal access. Marwati and Karyadi are just two of many in East Kalimantan still living without reliable electricity in a province dubbed the 'energy barn' of Indonesia.

"This isn't just about energy transition anymore. It's about basic access to energy, access that still hasn't reached everyone."

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Coal Dust and the Decline of Crab Harvests

by La Ode Muhlas

Kendari was once a thriving hub for mangrove crab fisheries. But that prosperity has faded since the rise of smelters and coal-fired power plants. The crabs no longer breed, the ecosystem damaged beyond recognition.

Thick gray clouds loomed over the sky in the second week of March 2025. That afternoon, Samsiah sat alone on the porch of her house, waiting for customers to drop by her small shop. Her ears throbbed from the endless roar of a nearby coal conveyor belt, just a stone's throw from her house in Kapoiala Subdistrict, Konawe Regency, Southeast Sulawesi.

Every day, she swept away coal dust blown over from the coal-fired power plant (PLTU) that supplies electricity to PT Obsidian Stainless Steel (OSS), a major nickel smelting facility. The smoke billowing from the power plant's chimney clings to her walls, settles on her kitchen utensils, and blackens every corner of her home.

A mother of three, Samsiah has spent the last two years selling daily necessities from her front porch. She turned to this trade after closing her once-thriving crab business that had flourished for more than two decades.

"Back then, there wasn't anyone in Kendari who didn't know me as the crab supplier," said the 53-year-old, reminiscing.

From the mid-1990s until 2022, Samsiah was a prominent name among crab collectors in the region. She purchased mangrove crabs from fishermen across Konawe and North Konawe regencies, selling them to major suppliers who exported them overseas. In addition, she operated a 20-hectare aquaculture farm, cultivating crabs, fish, and shrimp.

She still lives in the same wooden stilt house by the Motui River, where she started the crab business with her husband and daughters. The river, flanked by dense mangrove trees, once served as the primary lifeline connecting surrounding villages.

Vast aquaculture ponds crisscrossed the area, and nearly every family depended on crab fishing and pond farming for their livelihood.

Samsiah specialized in trading Scylla serrata, a species of mangrove crab recognizable by its oval-shaped carapace. These crabs thrived in mangrove forests and estuarine waters, where fresh and saltwater meet. Back then, the crab population was abundant, with fishermen hauling in sacks of catch using simple traps.

From across the river, fishermen would bring Samsiah tens to hundreds of kilograms of crabs every week. "We didn't use terms like A1 or A2 back then. A 200-gram crab was already labeled BS (best size), and a 'super' crab was between 300 grams to over a kilogram," she said [19].

These "super" crabs were in high demand for export due to their large size and meat density, which could be assessed by pressing the crab's breastplate, the firmer it was, the more mature the meat. If not yet firm, they'd be fattened in ponds for some time before sale.

Known locally as Haji Tio, Samsiah sold the crabs twice a week to a major buyer in Kendari City. Each shipment ranged from 500 kilograms to nearly a ton, generating tens of millions of rupiah in revenue.

"We often earned over Rp10 million from a single sale, even Rp20 million sometimes," she said.

Thanks to her crab business and aquaculture farm, Samsiah and her husband were able to perform the Hajj pilgrimage through the *Furoda* scheme, a direct visa granted by the Saudi Arabian government, bypassing Indonesia's long waiting list. She also managed to fund her eldest daughter's medical school studies at Halu Oleo University, though the daughter later switched majors due to academic challenges.

From crab profits alone, Samsiah paid cash for a house worth over Rp2 billion. She also purchased two new vehicles, each worth nearly Rp1 billion, adding to the two she already owned. "Back when there were still forests here, I already had two cars," she said proudly.

19 The label "A1" is a grading code used by sellers to differentiate this crab type from others like "A2," which typically cost less because they weigh less than A1 crabs. On the other hand, "BS" stands for "best size," indicating crabs that are large and of high quality.

Crabs Caught by Fishermen Tainted with Coal Dust Dark lines are visible on the shells, evidence of pollution. (Photo by La Ode Muhlas)

Soot Arrives, Crabs Disappear

Over time, Samsiah's crab sales and aquaculture harvests began to decline. The downturn started when the ferronickel plant of PT Virtue Dragon Nickel Industry (VDNI) was established in August 2014. Four years later, PT Obsidian Stainless Steel (OSS), a foreign-invested company processing nickel ore into stainless steel, began operations. Both smelter plants are part of Indonesia's National Strategic Projects (Proyek Strategis Nasional/ PSN) located in the Konawe Industrial Zone (Kawasan Industri Konawe/ KIK), designed to support the government's ambition to supply materials for electric vehicle batteries.

The development of these smelters carved through the topography of four subdistricts in two regencies, clearing land for two large hauling roads that sliced through villages. These roads constricted water bodies, including river habitats for crabs, and buried dozens of hectares of fishponds, key sources of local livelihood.

Measuring 30 meters wide, the roads became exclusive routes for dump trucks transporting coal and nickel ore from jetty ports to the smelting facilities. The materials were carried in open trucks, scattering dust and coal fragments along the way.

Coal fuels the power plants (PLTUs) that drive the massive energy demands of both smelters. VDNI's captive power supply reaches 530 megawatts, consuming approximately 15,000 tons of coal per month, or 180,000 tons annually. Meanwhile, OSS requires 1,820 megawatts and burns an estimated 522,936 tons of coal per year. Additionally, around 756,000 tons of coal are used annually as a heating and reducing agent in the rotary kilns, according to WALHI Southeast Sulawesi.

Residue from the coal has spread throughout the communities surrounding the PLTU. Black dust travels with the wind, settling into soil and water. It coats trees, rooftops, walls, and even seeps into the interiors of people's homes. Household kitchenware has not been spared from the soot's reach.

Rainfall washes the coal waste into the river sediment, eventually flowing into local fishponds. In certain sections, the river water now runs thick and dark, a stark visual of ecological collapse.

A wastewater discharge pipe from the OSS coal-fired power plant empties directly into a river. According to WALHI Southeast Sulawesi, tests on water and sediment samples from the discharge site and nearby community fishponds revealed concentrations of heavy metals, cadmium and copper, that exceed the national environmental quality standards. (Photo by La Ode Muhlas)

WALHI Southeast Sulawesi has identified the Motui River, once a thriving ecosystem for crabs and a vital irrigation source for local shrimp ponds, as suffering from dual ecological destruction. The river is now contaminated by coal dust and industrial effluents, a conclusion backed by a joint study conducted by WALHI and La Ode M. Aslan, a marine and fisheries researcher and professor at Halu Oleo University (UHO).

Water and sediment samples were collected from the waste discharge site and surrounding shrimp ponds. Lab analysis, using national standards (SNI 6989.16-2009), revealed alarming levels of cadmium (Cd) at 0.0977 mg/L—nearly ten times the permissible limit of 0.01 mg/L, as stipulated in Government Regulation No. 22/2021 on Environmental Protection and Management. Further tests (SNI 6989.6-2009) showed copper (Cu) contamination at 0.0485 mg/L, more than double the acceptable threshold of 0.02 mg/L.

According to Aslan, cadmium is a heavy metal that can damage fish tissue, suppress growth and reproduction, and impair immune and endocrine systems. "Acute exposure can increase mortality rates, while chronic exposure causes sublethal effects such as stunted growth and failed reproduction," he said.

Crabs, shrimp, and fish have limited tolerance to polluted environments, but prolonged contamination leads to stunted development and behavioral changes. Aslan noted that heavy metals, particularly cadmium and copper, compromise shrimp immune systems, leaving them vulnerable to disease and death as pollution intensifies.

Citing the 2021 Toxicology Reports journal article Effects of Coal Microparticles on Marine Organisms: A Review by M.O. Tretyakova et al., Aslan added that coal dust particles settling on seabeds degrade benthic habitats, alter sediment composition, reduce oxygen availability, and disrupt gas exchange in fish gills. Additionally, coal particulates hinder sunlight penetration into water columns, reducing photosynthesis in aquatic plants and algae. This cascade disrupts aquatic food chains and diminishes ecosystem productivity.

Andi Rahman, Executive Director of WALHI Southeast Sulawesi, emphasized that coal pollution and industrial waste are degrading both marine and agricultural livelihoods. "Our findings show a significant increase in poverty among residents in the Morosi region due to the contamination of their primary economic resources," Rahman explained.

Export Crab Supply in Decline

Contaminated waters have led to a sharp drop in crab supplies, particularly those destined for export. Samsiah, a former crab trader, said nearly all her suppliers have disappeared. “Just one or two people still bring crabs, and even then, there's barely any left," said the woman, now running a small convenience store and scrap metal business.

The story is similar for Tajudin, a crab fisherman from Kapoiala village in Konawe Regency. Despite deploying numerous traps for days, he often returns empty-handed, a stark contrast to his abundant harvests before mining operations began. His farmed fish and shrimp regularly die, floating atop his now dark and polluted ponds.

“People are crying now. This coal dust, ugh, it's devastating," said Tajudin, who has been crab fishing since 1991.

In his prime, Tajudin relied on simple bamboo traps baited with a few shrimp. Each trap could catch up to five crabs. “Back then, you could just lift a piece of wood from the river and see a bunch of crabs clinging underneath," he recalled during a March interview at his home.

Anwar (50), a resident in the Konawe smelter industrial area, serves as a crab collector supplying exporters. (Photo by La Ode Muhlas)

He used to sell between 50 to 70 kilograms of crabs every two to three days, netting up to Rp10 million weekly from buyers who came three times a week. In addition to fishing, Tajudin managed a 14-hectare pond, raising thousands of fish and shrimp each seeding cycle. Within 3 to 4 months, he could harvest 2 tons of fish and 1 ton of shrimp.

“Sometimes, a single harvest could bring in Rp300 million to Rp400 million," he said.

Today, those days feel like a distant memory, as coal dust and industrial pollution cast a long shadow over what was once a thriving coastal economy.

The hardships faced by Tajudin, a long-time crab fisherman, have also reached Anwar, a local crab collector who regularly purchased Tajudin's catch. As crab harvests continue to dwindle, so does Anwar's business.

“There used to be plenty of crabs. It's different now, ever since the mining started,” Anwar lamented.

Anwar supplies wild-caught crabs to exporters. In the past, he routinely delivered no less than 100 kilograms per shipment. Now, his shipments have significantly declined.

One exporter, Sulkarnain, shared that Morosi, once a major source of crabs and the site of PT OSS and VDI operations, is no longer reliable. He now depends on just two regular suppliers: Anwar and Lian. His shipments have dropped to just twice a week, 60 kilograms each, reflecting a decline of more than 50%.

To meet export demand, Sulkarnain has shifted procurement to collectors in other districts, including South Konawe, Muna, Kabaena, and Konawe Islands. He's also opened additional export branches outside Southeast Sulawesi, in cities like Palu, Ternate, and Makassar. “Kendari can no longer keep up. We used to export daily because the supply was abundant. Now, many regions have been overtaken by mining,” he said.

According to data from Kendari Customs, exports of mangrove crabs from Southeast Sulawesi to Singapore dropped by 13,653 kilograms in the past year, from 43,644 kilograms the year before.

This export decline aligns with findings from Celios, a policy research institute, which reported that the nickel industry has a generally negative impact on fisheries and agriculture. Their study indicates the industry could result in economic losses of over IDR 6 trillion in added value over 15 years, along with an estimated IDR 3.64 trillion in income losses for fishers and farmers over the same period.

The author reached out to VDNI spokesperson Ihsan Amar on April 29, 2025, but has received no response. In addition to sending messages via chat applications, formal interview requests were also submitted to VDNI and OSS on the same date. As of publication, neither company has replied.

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Vanishing Seaweed in Torobulu: Nickel Mining's Casualty

by La Ode Risman Hermawan

The port (jetty) of a nickel mining company operating in Torobulu Village, Laeya Subdistrict, South Konawe Regency, Southeast Sulawesi. (Photo by La Ode Risman Hermawan/Kendariinfo).

Ambo (37) can no longer harvest seaweed. He is one of many seaweed farmers in Torobulu Village, Laeya Subdistrict, South Konawe Regency (Konawe Selatan/Konsel), Southeast Sulawesi (Sulawesi Tenggara/Sultra), who have lost their livelihoods. Since the operations of nickel mining companies PT Billy Indonesia (BI) and PT Wijaya Inti Nusantara (WIN) began in the village, crop failure has loomed over seaweed farming, until it ceased completely in 2021.

"The income used to be decent. For example, if I sold 10 bundles of wet seaweed, I could earn Rp1 million. That's Rp100,000 per bundle. If someone took 10, I'd get a million rupiah. That doesn't even count the dried ones. So, money was flowing in constantly," Ambo said on Thursday, February 28, 2025.

Nearly all fishermen in Lorong Bajo, Torobulu Village, like Satar (42), Kamaruddin (44), and Daeng Harman (40), followed Ambo's path into seaweed farming. According to Ambo, seaweed cultivation before 2010 was

a joyful endeavor. The process of planting, maintaining, and harvesting was easy, and each harvest yielded promising income.

Infographic of Nickel Mining Activities Impacts in Torobulu Village, Laeya Subdistrict, South Konawe Regency, Southeast Sulawesi[20]. Design by Chevin Breemer

"I remember how satisfying it was," Ambo said. "A harvest could earn me Rp6 million, sometimes Rp7 million, even Rp10 million."

Not only farmers like Ambo, Satar, Daeng Harman, and Kamaruddin, but also children and women benefited from the seaweed production. They took part in attaching seaweed seedlings, earning Rp5,000 for each line. A single seaweed line measured 20 to 30 meters in length.

Each child or woman could attach up to 10 lines of seaweed seedlings per day. For children, the income was more than enough for pocket money. For women or housewives, it significantly supported the household economy. "It also created jobs," added Satar, continuing Ambo's story.

At the end of 2017, PT WIN officially began operations in Torobulu. The massive activities of PT WIN, aligned with the national downstream nickel

20 This infographic highlights the multifaceted impacts of nickel mining in South Konawe, Southeast Sulawesi. The mining runoff has damaged seaweed farming areas by blocking sunlight needed for photosynthesis, leading to the loss of a key local livelihood. Many seaweed farmers have been forced to change professions, often earning significantly less. In Torobulu, the community's last natural water sources—Kali Engko and the public water system (PAM)—have dried up or become contaminated, raising fears of drought. Residents who protested the mining activities have faced criminalization, with two community members prosecuted for questioning the company's land claims.

policy, became a point of concern for the community. In addition to erasing the livelihoods of seaweed farmers, PT WIN also mined near residential areas and the premises of SDN 12 Laeya (Laeya Public Elementary School No.12). PT WIN even conducted mining operations within the village's clean water reservoir.

PT WIN began operating in Torobulu after acquiring shares from PT Billy Indonesia (BI), which had previously been mining from 2010 to 2016. The Head of the Southeast Sulawesi Environmental Office (DLH), Andi Makkawaru, explained that the nickel mining sites of PT WIN and PT BI were originally part of the concession held by PT International Nickel Company (Inco) Tbk., now renamed PT Vale Indonesia (VI) Tbk., since 1968.

PT Inco officially relinquished its contract of work in Torobulu after the issuance of Law Number 4 of 2009 on Mineral and Coal Mining. The regulation required foreign companies to initiate the process of relinquishing concessions to local governments. In 2010, PT Inco handed over its entire concession to the South Konawe Regency Government, which later sought new investors and granted a license to PT BI.

"When the concession renewal was being processed under Law Number 4 of 2009, PT Inco had to downsize. The regulation stated that foreign companies could not hold control; they had to go through a relinquishment process. That's when the asset was released," said Andi Makkawaru on Tuesday, April 29, 2025.

That evening, Ambo, Satar, and Kamaruddin sat together enjoying a cup of warm sweet tea, reminiscing about the prosperous seaweed farming days on their coastal village, Thursday, February 28, 2025. Suddenly, Daeng Harman joined in the nostalgia. Harman was also a former seaweed farmer in Torobulu and is now forced to work as a crew member on a fishing boat known as *gae*.

Harman had just returned from Bombana, where his fishing boat docks. He came home to spend the first days of Ramadan with his wife and children after being at sea for two months. "I just got back from Bombana. Came home for the fasting month. Sometimes we're at sea for two months straight. Planning to leave again in two days," said Harman.

Harman, Ambo, Satar, and Kamaruddin share a similar fate. Transitioning to new jobs has not necessarily improved their family economies. As a *gae*[21] crew member, Harman earns only around Rp1 to Rp2 million per month.

21 *Gae* refers to a traditional fishing boat equipped with purse seine nets, commonly used by local fishers in Southeast Sulawesi.

Meanwhile, Ambo, Satar, and Kamaruddin go fishing daily with their own small boats around the village.

Their income often doesn't even cover the cost of fuel. "Now, we go out just to get by, hoping we don't fall ill. Some days we make Rp50,000, sometimes Rp70,000. It's unpredictable," said Ambo.

No More Seaweed in Torobulu

Ambo, 37, a former seaweed farmer from Torobulu Village, Laeya Subdistrict, South Konawe Regency, Southeast Sulawesi . (Photo by La Ode Risman Hermawan/Kendariinfo)

On the porch of Satar's stilt house above the sea, Ambo recounted how he was the first to introduce seaweed to the coast of Torobulu. The seaweed farming practice, known locally as *agar*, was brought by Ambo from his hometown in South Sulawesi.

"I was the first to farm agar here. I used to work with seaweed back in South Sulawesi. I farmed it everywhere," said Ambo, speaking with a thick Bugis accent.

He vividly remembers the early days of cultivating seaweed along Torobulu's shores. Every type of seaweed seedling he planted thrived. There were no bacterial infections or pest attacks. The quality of the seaweed was exceptional.

"I admit it, Torobulu's agar never got moldy. Back in my hometown, in Makassar, sometimes it would grow mold. But not here," Ambo shared.

Ambo recalled the first times he enjoyed the profits of his harvest. Back then, the price was only Rp6,000 per kilogram. Even at that rate, Ambo was able to produce 500 kilograms per harvest, earning a gross income of Rp3 million each cycle. Over time, the price of seaweed rose.

He was thrilled by the price increase and decided to ramp up production. In one round of planting, he spread out 300 seaweed lines along the Torobulu coast. With that scale, his harvest of dried seaweed never fell below one ton.

His joy reached its peak when the price of dried seaweed soared to Rp20,000 per kilogram. For Ambo, selling seaweed, whether fresh or dried, was equally profitable. Even before harvest, he had already sold dozens of seaweed lines to other farmers as seedlings.

Seaweed farming in Torobulu came to a halt in 2010 when PT Billy Indonesia (BI) began nickel mining operations. However, locals resumed seaweed cultivation after PT BI ceased operations in 2016. Unfortunately, in 2019, PT Wijaya Inti Nusantara (WIN), PT BI's successor, began operating, in line with President Joko Widodo's push for nickel downstreaming.

Under the Ministry of Energy and Mineral Resources Regulation No. 11/2019, which amended a previous regulation on mineral and coal mining, nickel mining in Torobulu intensified. The renewed mining activities once again wiped out the livelihoods of seaweed farmers along the coast.

Satar recalled that 2021 was the last time he cultivated seaweed. That year marked the final appearance of seaweed along the Torobulu shore. “Back in 2021, the seaweed was still growing well. This man used to have so much seaweed," Satar said, pointing to Ambo.

Kamaruddin, 44, a former seaweed farmer from Torobulu Village, Laeya Subdistrict, South Konawe Regency, Southeast Sulawesi. (Photo by La Ode Risman Hermawan/Kendariinfo)

He seemed hesitant to state outright that the seaweed failure was due to nickel mining. “Now the seaweed is damaged, no longer promising. I don't know what caused it, maybe the weather, maybe the mining," Satar said.

But for Kamaruddin, the culprit is clear: the nickel mining companies. He recalled attempting to revive seaweed farming in 2022 with an initial capital of Rp1 million, only to lose everything.

Red soil from the mining site flowed into the sea. The murky water then reached the seaweed lines. That exposure halted growth and caused the seaweed to detach and die.

"When the red soil from the hills hit the seaweed, it turned white, snapped off, and was gone, nothing left," Kamaruddin explained.

Kamaruddin and other residents only received community development (comdev) compensation ranging from Rp100,000 to Rp500,000 for their losses. "It used to be every month. Now it's only twice a year," Kamaruddin said.

Marjumagus, Head of the Aquaculture Division at the Southeast Sulawesi Maritime and Fisheries Office, confirmed that seaweed is an extremely sensitive crop. It requires calm currents and clear water to thrive. Exposure to sediment can hinder its growth, or even kill it.

"Seaweed is very sensitive, especially near mining activities. From a cultivation standpoint, seaweed cannot survive in strong or murky currents. If the water is murky, it won't grow, let alone if it's contaminated," said Marjumagus on Monday, April 21, 2025.

Infographic of seaweed production in South Konawe Regency (in Tons). Design by Chevin Breemer.

Marjumagus stated that the main center for seaweed farming in Konawe Selatan now remains only in Tinanggea District, located about 25 kilometers west of Torobulu Village. He admitted that seaweed cultivation has been significantly disrupted by nickel mining activities in several regions.

Currently, the Southeast Sulawesi Maritime and Fisheries Office limits its distribution of seaweed seedlings to non-mining areas, particularly in island

regions such as Muna, West Muna, Wakatobi, Central Buton, and North Buton.

According to Marjumagus, seaweed is actually a flagship commodity in Southeast Sulawesi. Varieties such as *Eucheuma spinosum* (Rhodophyta) and *Eucheuma cottonii* or *Kappaphycus alvarezii*, cultivated using the long-line method, are well-suited to local waters. The operational costs are low, the market reach is broad, and the harvest cycle is relatively short, only 20 to 45 days.

"Seaweed sources that used to be excellent, like in North Konawe, are no longer prioritized for aid. It used to be an outstanding area. Now we're also starting to reduce support for South Konawe," he said.

The Last Spring in Torobulu

Infographics of PT Wijaya Inti Nusantara (WIN) excavator activities near the community's last water source in Torobulu Village, Laeya Sub-district, South Konawe Regency, Southeast Sulawesi. Design by Chevin Breemer.

In addition to the loss of seaweed farming potential, the presence of PT WIN also poses a threat to the community's last remaining source of clean water in Torobulu. In October 2023, the village's water reservoir (*cekdam*[22]) suddenly ran dry. Ayunia Muis (29), along with 31 others from the Torobulu Alliance for Human Rights Defenders, lodged a protest with the village authorities.

However, they were told the reservoir had dried up due to the dry season.

22 Cekdam or in Indonesia the term cekdam is commonly used.

The explanation did not sit well with the residents, as the *cekdam* had continued to supply water to homes even during the previous year's drought. They demanded accountability. To address the issue, the village government sought permission from residents to use PT WIN's heavy equipment to repair and deepen the reservoir.

The request was approved. While the repair and deepening works were underway, PT WIN provided water aid to affected residents. A single 1,200-liter water tank was delivered once a week. This volume, however, was insufficient. To meet weekly needs, villagers had to purchase an additional tank of water for Rp60,000 to make up the shortfall.

Cekdam or clean water reservoir for the community of Torobulu Village, Laeya Subdistrict, South Konawe Regency, Southeast Sulawesi. (Photo by La Ode Risman Hermawan/Kendariinfo)

PT WIN only provided water assistance to residents who supported their operations. Members of the Torobulu Alliance for Human Rights Defenders, who vocally opposed the company's activities, received no aid. For seven consecutive weeks, those in the alliance had to purchase two water tanks per week to meet their needs.

"We had to buy water for nearly two months. They [supporters of the company] were given one 1,200-liter tank per week, while those of us who opposed the mining weren't given anything, not even allowed to buy water," said Ayu.

A week after the repairs and deepening of the *cekdam* began, the water began to flow again, though only in a trickle. When residents checked the repair site, they found that PT WIN was actually conducting ore getting, or nickel extraction, from within the reservoir. "They said the material had to be removed for the deepening process. I said, if that's the case, removing the material is fine, as long as the focus remains on repairing and deepening, not mining in the reservoir," Ayu stated.

Ayu expressed frustration that the *cekdam* repairs, which should have focused solely on deepening, remained unfinished even as the rainy season began. "When the rainy season came, the reservoir just ended up as a rain catchment pond," she lamented.

Throughout this period, Ayu and other dissenters received no water assistance from PT WIN. Even when trying to buy water from vendors contracted by the company, they were denied. Fortunately, one of the 32 dissenters owned a pickup truck, which was used to deliver clean water to those excluded from the aid.

"One of our friends had a pickup. He sympathized with us and took the initiative to sell water to those of us who opposed the company," Ayu added.

The *cekdam* was the last remaining water source for Torobulu residents. Two other sources, Kali Engko and PAM[23], were no longer usable due to PT WIN's mining operations. Ayu recalled that Kali Engko, once located behind SDN 12 Laeya, was frequently used by the community for collecting water and doing laundry.

Kali Engko dried up completely following PT WIN's mining activities, which began in 2019. The second source, PAM, also became unusable after mining began near the spring in 2021. "Kali Engko has long been gone since PT WIN started mining behind the school. There's still water there now, but it's in old, unreclaimed mining pits. PAM technically still exists, but it's just like a pond now, and we all know the quality of that water," Ayu explained.

Andi Makkawaru, Head of the Southeast Sulawesi Environmental Agency (DLH), stated that mining near natural springs is prohibited under Law No. 32/2009 on Environmental Protection and Management. "According to regulations, that's not allowed. Everyone is supposed to protect water sources," he emphasized.

23 PAM stands for Perusahaan Air Minum or public water system in Indonesia. PAM also refers to an entity that provides clean water services to the public through a piped distribution network.

However, Andi admitted that DLH has no authority to sanction the company, as the authority to issue permits and oversee environmental management plans lies with the South Konawe Regency government. DLH can only offer recommendations or warnings to the local government.

"When the authority cannot be exercised effectively, we provide input, suggestions, opinions, even formal warnings, to the regency government regarding environmental management. But our communication is with the government, not directly with the company," he clarified.

Meanwhile, PT WIN's Public Relations Officer, Kasman, stated that all company activities are legal and fall within their official mining business permit (IUP) area. Affected residents, he said, have received compensation. Kasman claimed that PT WIN routinely carries out land reclamation, offers corporate social responsibility (CSR) programs, and hires local residents as employees.

"We would never operate without legal status. We also contribute through social aid, bore wells, and food packages," Kasman said.

Battling Nickel Mining Ends in Criminalization

Ayunia Muis, 29, a woman active in the Torobulu Alliance of Human Rights and Fighters. (Photo by La Ode Risman Hermawan/Kendariinfo)

Eight barges and their tugboats were seen around the jetty owned by PT WIN on Tuesday, March 4, 2025. Some barges were queuing at the dockyard and out at sea, while others were anchored at the jetty being loaded with nickel-rich soil, dumped by large trucks in turn.

Ambo claimed that the area where the vessels now dock was once where he used to plant seaweed seeds. "The jetty is right there, at the spot where I used to set up my seaweed lines. On this cape, exactly at the jetty. They told me, 'Take out all your seaweed. We want to dock a ship,'" said Ambo, mimicking the mining company's request.

Ambo did not stay silent as his livelihood was disrupted. Together with residents of Lorong Bajo, Torobulu Village, he staged protests three times, each time taking to the sea with their boats, leaving their wives and children behind for two to three days, attempting to halt the port's operations. However, Ambo and the residents lost to the mining company, backed by the police.

"How could we go against the police? We'd end up fighting. Better to give in, we're just ordinary people. They have ranks. If we resist, we might end up in jail," said Ambo.

He also expressed disappointment toward those who rallied the villagers to protest against the nickel mining activities, only to benefit personally from the company. "Seems like people here have had enough. We've been used three times like that. If someone comes again claiming to be a field coordinator, joining us in protest, the same thing happens. That coordinator never shows up again once the protest is over," he said.

Efforts by fishermen and seaweed farmers to resist were also weakened by the company's claims that laboratory tests showed no contamination in Torobulu's coastal waters. Ambo said he received information that water quality tests showed no pollution from mining waste. "They tested the water. The company claimed the water quality was fine. Supposedly, there's no mining impact. But when I planted seaweed, it all fell apart. The stems were slimy," Ambo explained.

Following this defeat, Ambo now works as a fisherman with uncertain daily income. Yet, resistance to nickel mining in Torobulu hasn't been entirely silenced. One of the women leading the opposition is Ayunia Muis. She and 31 others form the Torobulu Human Rights and Justice Alliance. A small number compared to Torobulu's total population of 3,132.

According to Ayu, PT WIN's operations in Torobulu have been met with protests since 2019. Besides destroying the livelihoods of seaweed farmers, PT WIN has also mined near residential areas and behind SDN 12 Laeya. "In 2019, the company was operating behind the school. But that year, the government intervened and tried to resolve the conflict," Ayu said on Tuesday, February 28, 2025.

Ayu and the 31 others voiced stronger opposition in October 2023 when PT WIN mined near the community's only freshwater reservoir. On Monday, November 6, 2023, around 8:45 a.m. local time, Ayu and her fellow activists demanded to see PT WIN's Environmental Impact Assessment (AMDAL)

documents by blocking one of the company's excavators from digging.

Instead of presenting the AMDAL documents, PT WIN reported the villagers for obstructing mining activities. “Actually, we've been criminalized many times—reported to the local police station, the district police, and the provincial police. Eventually, the case reached the Southeast Sulawesi Provincial Police, and two of our friends were named suspects and taken to court,” said Ayu.

The two Torobulu villagers who were named suspects and later defendants were Haslilin (41) and Andi Firmansyah (43). After 14 hearings at the Andoolo District Court, both were acquitted. “We do not inherit this earth and its resources from our ancestors, we are merely borrowing them from our grandchildren. Take care of them so they too may see the green earth,” said Chief Judge Nursinah while reading the verdict on Tuesday, October 1, 2024.

However, Haslilin and Andi Firmansyah have yet to be fully free of legal entanglements. Ayu said the public prosecutor filed a cassation appeal to the Supreme Court regarding their acquittal. “The prosecution filed for cassation to the Supreme Court, and as of today, the decision has not been issued. We're still entangled in legal proceedings,” Ayu said on Friday, February 28, 2025.

Teguh Oki Tribowo, Head of Intelligence at the South Konawe District Attorney's Office, confirmed that prosecutors submitted the cassation memorandum for case numbers 58/Pid.Sus-LH/2024/PN Adl and 59/Pid.Sus-LH/2024/PN Adl to the Supreme Court on October 15, 2024. The cassation request for case number 58, involving Andi Firmansyah, was rejected by the Supreme Court due to formal procedural deficiencies.

The rejection was stated in the court's notice of return of electronic cassation documents, number 170/PAN.5/HK.2.2/III/2025, dated March 24, 2025. Meanwhile, the cassation appeal for case number 59, involving Haslilin, remains under review by the Supreme Court.

While the legal process is ongoing, PT WIN resumed excavating right next to the wall of SDN 12 Laeya, an area that had been rejected by locals from the outset. On Friday, February 28, 2025, two large adjacent pits were seen next to the school wall, remnants of excavator operations. The holes were only 50 to 100 centimeters from the school wall.

The first hole, about two meters deep, contained reddish soil, with a pile of earth in the middle. The second pit was deeper, approximately seven

meters. Its base and sides revealed yellow-green soft rock and soil, while other sections showed hard black rock and reddish earth.

About 500 meters east of SDN 12 Laeya lies the freshwater reservoir that supplies Torobulu residents. According to Ayu, the dam is the only water source for residents of Hamlets III and IV in Torobulu Village. “These two hamlets can't dig wells. So, there's no other water source," Ayu explained.

Two large water-filled pits serve different purposes. One is the main reservoir supplying piped water directly to households. The other serves as a backup reservoir, where water must first be filtered before being transferred to the main tank.

Two pipes, one 12 inches and the other 2 inches in diameter, extended into the main reservoir, secured with a floating ball. These pipes distribute water to 260 homes, occupied by 308 households in Hamlets III and IV.

The football field-sized reservoirs are now surrounded by mounds of red earth left by heavy machinery. A small blue tent stood atop one mound near the reservoir. Such tents are commonly used by mining company staff to shelter while monitoring excavator operators extracting nickel ore.

However, in October 2023, Ayu had to purchase clean water after PT WIN began mining near the reservoirs. She received no assistance from the village government or the company. This situation arose from her refusal to support the mining activities. Her group's small numbers also led to marginalization. Torobulu society is now divided, those who oppose the mine and those who support it.

“In the early days of this struggle, I always said, my issue is only with the company, not the community," Ayu stated. But the social divide became inevitable.

Ayu's objections were reasonable. She and her group simply questioned the mining's proximity to residential areas and schools and sought to preserve the community's water source. Regarding clean water, Ayu is deeply worried. She fears the water source may not last under the current intensity of nickel mining in her village.

“We are only defending our rights. Will the water source we have today still be enough for our children and grandchildren? That's what worries us," Ayu said.

On Thursday, February 27, 2025, Ayu organized a community screening of the third episode of the documentary *Republik Rente* from the Bloody Nickel

series, produced by a civil society coalition comprising Watchdoc, Jatam, Trend Asia, Transparency International Indonesia, YLBHI, and Greenpeace. At 9 p.m. local time, 20 residents gathered in Hermina's yard in Lorong Indra, Torobulu Village, to watch the film together, accompanied by fried bananas and instant coffee.

"My hope is that people become more aware. We must fight for a better Torobulu so it doesn't get destroyed. Whether they support or oppose mining, we're all victims of what the company is doing today," Ayu said.

She organized the screening to rally more support against nickel mining in Torobulu. According to Ayu, many villagers oppose mining but are afraid to speak out.

Through *Republik Rente*, Ayu wanted the villagers to collectively understand and feel the tangible negative impacts of nickel mining. She believes that she and the people of Torobulu are simply victims of corporate greed.

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Taufik Qurahman

Southeast Sulawesi

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Turning Trash to Power or Truth to Deception?

by Taufik Qurahman

A scavenger rushes to a pile of waste that has just been dumped from a truck at Puwatu landfill in Kendari City, Thursday, 1 May 2025. This landfill is the largest in Southeast Sulawesi with an incoming waste volume of around 270 tonnes per day. (Photo by Taufik Qurahman)

The sun was nearly setting, casting a soft orange glow across the western sky above the Mataiwoi Final Waste Disposal Site (TPA) in Mataiwoi Sub-district, Tongauna District, Konawe Regency, in mid-March 2025. Bode was still at work, wrestling with used plastic bottles, stuffing them into a large sack. Her frail hands pressed each bottle down, one by one.

Slowly but steadily, the sack, marked by two thick blue stripes, was nearly full. The elderly woman, well into her fifties, could be seen trembling from exhaustion. Yet, she refused to stop the activity that had been her daily routine for the past 20 years—at least not until the sack was completely packed. As the evening deepened, her hands moved faster, her breath growing more labored.

"I have to hurry with this work. My eyes can't see clearly if it gets too late," said Bode, tying the now-full sack and dragging it to line up with three others.

Each day, Bode manages to collect between 100 and 200 used plastic bottles and cups, sometimes less. Most of what she gathers consists of clear or colored drink containers. Twice a week, a scrap collector comes to pick up her recyclables along with those of other scavengers. The total often reaches 100 to 150 sacks.

With each weighing, Bode earns between IDR 300,000 and 400,000 from the three to six sacks of waste she collects over a 14-day period. “The younger ones can earn more than two million a month from just two weighings. But for me, I barely make one million," said Bode, who that day wore a long-sleeved shirt, a pink headscarf, and a conical hat commonly worn by farmers.

Bode, seen sorting used plastic bottles in front of her hut at the Mataiwoi Final Waste Disposal Site (TPA) in Konawe, mid-March 2025. According to the Konawe Environmental Agency (DLH Konawe), around 108 tons of waste are dumped at this site every day. (Photo by Taufik Qurahman)

The livelihood of scavengers like Bode and dozens of her peers at the Mataiwoi landfill (TPA) hinges entirely on the mercy of the “bosses”, a local term for waste collectors who purchase the fruits of their labor.

Tragically, these bosses often behave like middlemen, setting buying prices unreasonably low, with no clear standards and subject to change at will. It is no surprise, then, that even after spending more than half her life in this line of work, Bode admits she still struggles to make ends meet.

Like her, many waste pickers are trapped in a seemingly endless cycle of poverty, one that is often passed down through generations, as they lack alternative sources of income.

Yet, waste pickers play a crucial role in waste management. They help divert tens to hundreds of tons of trash from landfills to the recycling industry, forming an essential part of the national waste value chain.

Without their contribution, open dumping systems would cause landfills to fill up at an alarming rate, Mataiwoi landfill included, which receives 108 tons of waste daily.

Co-firing: A False Solution

Most recently, the co-firing program has been promoted in Southeast Sulawesi, dubbed "Bumi Anoa", as a way to process waste into RDF (Refuse Derived Fuel), to be used alongside coal at the Nii Tanasa coal-fired power plant (PLTU). Co-firing is the method of mixing alternative fuels, such as RDF from waste or BBJP (solid recovered fuel) from biomass, with coal to power steam-based electricity generation.

Under the plan, PT PLN Energi Primer Indonesia (PLN EPI), a subholding of state utility PT PLN overseeing the co-firing initiative, intends to partner with the local governments of Konawe, South Konawe, and Kendari City. These three areas were selected because they produce the most waste in the province, and continue to manage it through traditional open dumping methods at their landfills.

Acting Mayor of Kendari, Muhammad Yusuf; Acting Regent of Konawe, Stanley; and Regent of South Konawe, Surunuddin Dangga, pose after signing a cooperation agreement with PT PLN Energi Primer Indonesia (PLN EPI). (Photo by National Strategic Communication Team Public Relations)

According to data from the National Waste Management Information System (SIPSN) under the Ministry of Environment and Forestry (KLHK), the daily volume of waste in Southeast Sulawesi exceeds 1,000 tons. In Kendari City, waste volume reached 242.25 tons per day in 2023 and increased to 255.82 tons per day in 2024.

In Konawe Regency, the volume was recorded at 106.52 tons per day in 2023, rising slightly to 108 tons per day in 2024. However, no specific data is available for South Konawe Regency.

The high volume of waste generation in these three regions has fueled their enthusiasm to begin producing Refuse-Derived Fuel (RDF), following the cooperation agreement with PLN signed in August 2024.

Since 2020, the Nii Tanasa coal-fired power plant (PLTU) operating in Konawe Regency has piloted this co-firing program. The 2 x 10 MW capacity power plant mixes biomass, such as palm kernel shells and wood chips, with coal, maintaining a fuel mix ratio of 5% biomass and 95% coal.

"Throughout 2024, PLN Indonesia Power successfully utilized 793,060 tons of biomass sourced from wood pellets, waste, palm shells, sawdust, rice husks, and shredded banknote waste," said Edwin Nugraha Putra, President Director of PLN Indonesia Power, in an official statement in late January 2025.

However, this claim contrasts sharply with research findings by Trend Asia, which revealed that the co-firing program at 52 coal-fired power plants using biomass could potentially produce up to 26.48 million tons of CO2e-equivalent emissions.

These emissions stem from deforestation, HTE (High-Temperature Energy) processing, and the production of wood pellets. As the fuel is derived from tree biomass, co-firing at coal plants contributes to the deforestation of an estimated 2.33 million hectares of forest.

Rather than decreasing emissions, the biomass-coal mix is projected to increase emissions from coal-fired plants, which, according to Indonesia's Electricity Supply Business Plan (RUPTL) 2021–2030, are expected to reach 298.9 million tons of CO2e by 2030.

Biomass co-firing also emits particulate matter (PM10), which is hazardous to human health due to its large particle size. Emissions of nitrogen dioxide (NO2) and PM10 can be especially destructive, particularly when wet wood is used.

These findings align with a study conducted by the Institute for Essential Services Reform (IESR) and the Centre for Research on Energy and Clean Air (CREA) on *The Health Benefits of a Just Energy Transition and Coal Phase-Out in Indonesia*.

The study notes that applying a minimum 20% biomass co-firing mix across all PLN power plants would only reduce air pollution emissions from coal-fired power plants by 1.5% to 2.4%.

Detailed modeling of air quality and health impacts indicated that air pollution emissions from coal plants in Indonesia were responsible for approximately 10,500 deaths in 2022 and incurred health costs amounting to IDR 109.9 trillion.

The same study projects that the cumulative health impact from 2024 until the end of all coal plant operations could result in 303,000 air pollution-related deaths and health costs totaling IDR 3.2 quadrillion.

"Biomass co-firing will not substantially reduce greenhouse gas emissions if coal remains the primary fuel source in Indonesia's power generation fleet," CREA concluded in its report.

PLTU I Indramayu. (photo: web.pln.co.id)

The study aligns with on-the-ground findings from WALHI West Java, which monitored air quality at two biomass co-firing power plants: PLTU I Indramayu and PLTU Pelabuhan Ratu.

The data revealed a growing trend of intensified and thickened emissions from the chimneys of both PLTUs, contributing to worsening air quality and increasing health problems among nearby residents.

In light of these negative findings and research on co-firing practices across several regions, WALHI Southeast Sulawesi firmly rejects the proposed implementation of a similar program at PLTU Nii Tanasa, Konawe Regency.

"As far as I know, the co-firing program is just a sham," said Andi Rahman during a public forum hosted by the Alliance of Independent Journalists (AJI) Kendari on Wednesday, March 26, 2025, in collaboration with CSOs and academics under the Economic and Environmental Journalism Academy (AJEL).

The government continues to promote the co-firing initiative, through RDF and BBJP production—not only as a revenue source for local governments but also as a way to uplift the lives of waste pickers via fair wages and empowerment programs.

However, a critical question remains unanswered: Are the claimed economic benefits truly worth the environmental and public health costs? That's the question that demands a serious answer—not one that's left blowing in the wind.

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The Fragile Harvest: Kolaka's Farmers in the Shadow of Industry

by La Ode Risman Hermawan

Arifin, 61, a farmer from Okooko village, Pomalaa sub-district, Kolaka district, Southeast Sulawesi. (Photo by La Ode Risman Hermawan/ Kendariinfo)

Arifin hurriedly shut the irrigation channel flowing into his rice plot in Lorong Lawonia, Okooko Village, Pomalaa District, Kolaka Regency, Southeast Sulawesi. He feared that rain might bring water mixed with mud from nickel mine excavations. That afternoon, the weather was still clear, but Arifin worried it might rain during the night.

He blocked the channel using wood and stones. According to Arifin, rice plants that have been submerged in muddy water grow stunted, produce fewer tillers, and turn yellowish. "This is what I mean," said Arifin, pointing to a rice plot located alongside the irrigation stream when met by *Kendariinfo* on Wednesday, March 19, 2025.

The 61-year-old farmer explained that his rice was only two weeks old. Unhealthy rice plants typically have no more than five new tillers, while healthy rice can grow 15 to 20 tillers.

The number of tillers significantly affects Arifin's harvest schedule and crop yields. "For example, if one rice plot is exposed to red soil, it ripens later than the others. Meanwhile, the agricultural agency recommends simultaneous harvesting," he explained.

According to Arifin, since nickel mining became widespread around Okooko Village, rice farmers have seen a decline in harvested dry unhusked rice (GKP) yields. From one hectare of rice field, Arifin and his Lawonia Farmer Group can only produce about three tons of GKP.

The Okooko River, tinted yellowish brown, serves as the primary irrigation source for rice fields in Okooko Village, Pomalaa District, Kolaka Regency, Southeast Sulawesi. (Photo by La Ode Risman Hermawan / Kendariinfo)

"Here, the average yield from one hectare is just three tons, if you're lucky. Five tons used to be normal. Sometimes the income doesn't even cover the capital," he admitted.

The primary cause of declining productivity, Arifin said, is the muddy water that frequently floods his rice fields. The irrigation water running through Lorong Lawonia originates from the Okooko River, which flows through Pomalaa and Tanggetada subdistricts. Along the stretch passing through Okooko Village, the river appears yellowish brown.

Executive Director of WALHI (the Indonesian Forum for the Environment) Southeast Sulawesi, Andi Rahman. (Photo by La Ode Risman Hermawan/ Kendariinfo)

That murky color comes from soil runoff from mining excavations along the Okooko River. A 2022 study by WALHI Southeast Sulawesi confirmed the river's contamination. One of the dangerous substances found was hexavalent chromium (Cr-VI), with concentrations ranging from 0.021 to 0.124 milligrams per liter.

These levels exceed the Class I–III water quality standards for river water as regulated under Government Regulation No. 22 of 2021 on Environmental Protection and Management.

"The contamination of community water sources and rivers with heavy metal toxins, particularly hexavalent chromium (Cr-VI) that exceeds both national and international water quality standards, as a result of mining activities is a corporate crime and a clear violation of international standards, including the UN Guiding Principles on Business and Human Rights," said Executive Director of WALHI Southeast Sulawesi, Andi Rahman, on Thursday, April 17, 2025.

Head of the Southeast Sulawesi Environmental Agency (DLH), Andi Makkawaru, speaking on the alleged pollution of the Okooko River linked to mining activities. (Photo by La Ode Risman Hermawan/Kendariinfo)

However, for Andi Makkawaru, Head of the Southeast Sulawesi Environmental Agency (DLH), determining whether a river is polluted requires testing at a laboratory accredited and registered with the Ministry of Environment and Forestry (KLHK) of the Republic of Indonesia. The former Acting Regent of Kolaka (2024) argues that the Okooko River has not exceeded the Class II threshold of river water quality standards.

"We cannot say the company is responsible for pollution if our lab does not apply proper sampling and testing standards. If the water body has not been officially classified, we follow the ministry's guideline that categorizes it as Class II. If it falls under Class II, then it is still considered safe," said Andi Makkawaru on Tuesday, April 29, 2025.

In Kolaka Regency, Southeast Sulawesi, 13 nickel mining companies are currently operating, nine of them in Pomalaa District alone. Major players like PT Aneka Tambang (Antam) Tbk. and PT Vale Indonesia Tbk. dominate the landscape. But pollution in the Okooko River has also been linked to illegal mining practices in the area.

"Ever since the mining operations began up there, water has become a major issue for us farmers," said Arifin, a 61-year-old farmer from Okooko Village. "The impact has been massive. Mining and farming just don't mix."

As the head of the Lawonia Farmer Group, Arifin said they now manage only 20 hectares of rice fields. Four more hectares have become unproductive after being inundated with muddy runoff. "Only 20 hectares are officially recorded under our group. The rest are no longer usable, it's all red soil now," he explained.

Arifin fears flooding more than ever. Pointing to the irrigation canal, he stepped in to show how sediment had built up. Every time he lifted his foot, the water turned a cloudy brown. Soft, reddish mud clung to the canal's walls. “It's like banana fritter flour," he said.

What worries him more is the looming presence of the Indonesia Pomalaa Industry Park (IPIP), a nickel smelter complex backed by Huayou Cobalt, Vale Indonesia, and Ford Motor Company. Although still under construction, the national strategic project has already started acquiring land.

According to Arifin, 10 of the 20 hectares currently farmed by his group fall within the IPIP site. Once the smelter is fully operational, they'll be left with just half their land. Still, he has little choice but to keep going. “There's nothing good about having rice fields next to a mine. Maybe we'll lose the fight," he said quietly.

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Solar Dreams, Coal Realities: The Dilemma of The New Capital City's (IKN) Transition

by Novi Abdi

Solar panels at the Nusantara Solar Power Plant (PLTS Nusantara) in South IKN. These panels generate 50 MW of electricity for the new capital, marking the beginning of its energy transition phase. (Photo by Novi Abdi/ANTARA)

The rain had just stopped when I began my journey to the Nusantara Solar Power Plant (PLTS Nusantara), one of the largest solar energy facilities in Kalimantan.

Though the plant is only five kilometers from the Central Government Core Area (KIPP) of Indonesia's new capital city, the trip was more arduous than expected. What began as a firm gravel road turned into a slippery red clay path, riddled with muddy potholes. By the time I arrived, my motorcycle was caked in mud, and I was drenched in sweat.

There was no time to rest. I immediately pulled out my camera to catch the last rays of sunlight before dusk settled over IKN.

The day before, I had spoken with Agus Gunawan, the Director of Green Transformation for the Nusantara Capital Authority, who succeeded

Mohammed Ali Berawi. Under his leadership, what was once a clean energy plan on paper is now taking shape in the real world.

Inside the Authority's office, designed with large glass walls to maximize natural light, similar to the energy-efficient Vice Presidential Palace envisioned by architect Daliana Suryawinata, Agus explained that IKN currently requires around 200 megawatts (MW) of electricity. This powers government buildings, hospitals, civil servant housing, ministers' residences, electric transport, and even the Indonesian national football team's training center.

As a planned city, Nusantara is committed to clean energy, including solar (PLTS), hydropower (PLTA), wind (PLTB), geothermal, and natural gas. By 2040, hydrogen is expected to become a primary fuel, particularly for fuel cell-powered buses and trucks.

At present, IKN is in its first energy transition phase (2025–2030), which focuses on building large-scale solar power infrastructure and installing rooftop panels on government buildings.

In the second phase (2030–2040), hydropower and wind energy projects will ramp up, along with the development of green hydrogen as a new energy source. Battery storage systems will also be strengthened to ensure energy reliability.

The third phase (2040–2045) targets Nusantara to become the first city in Indonesia powered entirely by renewable energy, fully independent of fossil fuels. Carbon capture technologies and circular economy principles will also be implemented to ensure long-term sustainability.

“In the future, Nusantara won't just be a modern city, it will be completely green,” said Agus.

Nusantara’s Solar Horizon

To the west, the acacia forest outlines the 21,600 solar panels stretching across PLTS Nusantara, soaking up the final light of day before darkness falls over IKN.

According to PLN's research, this location, just five kilometers from KIPP, receives the highest solar radiation in the entire capital region. Daytime temperatures here range from 31–34°C, hot enough to leave foreigners sweating and breathless.

"This isn't just one of the largest power plants in Kalimantan, it also employs 337 local workers," Agus said.

The project began with a 10 MW capacity in March 2024, exactly one year after President Joko Widodo initiated its construction in November 2023. By May 2024, the plant had ramped up to a peak capacity of 50 megawatt-peak (MWp), distributing electricity through a 20 kV network, then channeling it underground into KIPP and residential zones.

"There are no overhead power lines cluttering KIPP," Agus emphasized.

The first phase of this USD 64 million (Rp 998.4 billion) project was led by PLN Nusantara Renewables in collaboration with its sister company, PLN Nusantara Power.

Phase two is being developed by PT Nusantara Sembcorp Solar Energi (NSSE), a joint venture between PLN Nusantara Renewables and Singapore-based SembCorp Utilities Pte. Ltd.

Director of Green Transformation of IKN Authority Agus Gunawan (Photy by Novi Abdi/ANTARA)

Agus underscored that the PLTS Nusantara project is a milestone in Indonesia's ongoing green energy transformation. The facility alone reduces carbon emissions by up to 104,864 tons per year. "That's equivalent to planting thousands of trees," he added.

During the plant's inauguration, President Joko Widodo and PLN CEO Darmawan Prasodjo reaffirmed the utility company's commitment to tapping into hydropower potential from nearby rivers and lakes.

Long-term plans include the Kayan Cascade Hydropower Plant in North Kalimantan, which could produce up to 9,000 MW. Additionally, PLN continues to explore mini and micro-hydro potential in the Mahakam River to support the capital's growing electricity demand.

"But remember," Agus concluded, "we're still in the transition phase."

Energy Transition and Coal-Fired Power Plants

The newly built solar power plant in Nusantara only generates 50 MW. Rooftop solar panels across government buildings have yet to reach full capacity. Meanwhile, electricity demand in Nusantara has already reached approximately 200 MW to support operations in the Central Government Core Area (KIPP) and other supporting facilities.

This 200 MW requirement includes power for housing, transportation infrastructure, public amenities such as hospitals, places of worship, schools, and sports facilities.

"We're serving the nation's capital, the place where important decisions are made, where major plans are developed and thought through," said Agus. "Here, even a flicker in electricity supply is unacceptable."

To cover the 150 MW shortfall, PLN connected Nusantara to the Mahakam Power Grid, which currently supplies electricity to Balikpapan, Samarinda, Tenggarong, and more recently, Bontang and Sangatta.

PLN built a dedicated substation for Nusantara: GIS 4 Sepaku/KIPP. GIS stands for Gas Insulated Switchgear, a type of substation that uses sulfur hexafluoride (SF6) gas for insulation, known for its excellent dielectric properties. It's also more compact, requiring less physical space.

"GIS is more resistant to extreme environmental conditions such as harsh weather, pollution, and earthquakes. Its reliability is high because the gas insulation is unaffected by humidity or pollution," explained Raja Muda Siregar, General Manager of PLN East Kalimantan Generation Unit (UIP KLT).

"GIS is our solution for building a smart electrical system that aligns with the vision for IKN," Raja added.

GIS 4 IKN is one of four key energy infrastructures under the stream 1 category, developed by PLN UIP KLT, to power Nusantara. In addition to GIS 4, other projects include: The 150 kilovolt (kV) Kariangau Ext 2 LB substation project directed toward GIS 4 IKN/Sepaku, the 150 kV high-voltage overhead transmission line (SUTT) from Kariangau to the GIS 4 IKN/Sepaku landing point, the 150 kV underground and overhead lines (SKTT/SUTT) connecting GIS 4 KIPP to GIS 4 IKN/Sepaku.

The Mahakam System currently has an available capacity of 911 MW, with a peak load of about 501 MW, leaving a surplus of 410 MW. It's also integrated with the Barito System in South and Central Kalimantan, together

producing a total available capacity of 2,369 MW. With a current peak load of only 1,545 MW, there is more than enough electricity to cover Nusantara's 150 MW need.

However, Agus pointed out that power supplied to IKN from the Mahakam System still comes with a caveat, it's generated by coal-fired power plants.

There are 26 coal-based power plants supporting the Mahakam Grid. These facilities burn coal to boil water, creating steam pressure that drives turbines and generates electricity.

Coal is clearly not a clean energy source. Its combustion emits various pollutants, especially carbon dioxide (CO2), sulfur dioxide (SO2), and nitrogen oxides (NOx), all of which contribute to air pollution and climate change. Additionally, coal combustion releases particulate matter and other pollutants harmful to the environment.

"That's why this is called a transition," Agus reiterated. "A transition means change, gradual and well-planned."

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https://kaltim.antaranews.com/berita/237813/transisi-energi-di-ikn-50-mw-dari-plts-150-mw-dari-batu-bara

PART

III

Lighting Hope in the Shadows

ALIANSI JURNALIS INDEPEN

Yuda Almerio Pratama Lebang

East Kalimantan

intuisi.co / prolog.co.id

Yuda Almerio is a journalist based in Samarinda who began his media career in 2012. He currently contributes to *detik.com* as a correspondent in East Kalimantan, and occasionally writes for environmental-focused outlets such as *Mongabay.co.id* and local online media *intuisi.co*. Over the past five years, he has developed a strong interest in covering environmental issues.

The Bright Turn: Muara Enggelam's Story of Energy and Change

by Yuda Almerio Pratama Lebang

Remote areas could become the spearhead of the energy transition, harnessing the sun to power every aspect of life, including the economy.

Muara Enggelam Village Head, Madi, shows the communal solar power plant (PLTS) that has been in place since 2015. (Photo by Yuda Almerio/Intuisi.co)

Night hadn't fully settled when Asniah prepared to go to the mosque for evening recitation. Darkness had already arrived in Muara Enggelam, Kutai Kartanegara, a village without land, where night falls without waiting for the sun to fully set. As dusk fades, the darkness wraps around like a damp blanket, swallowing every direction.

With no electricity or streetlights, only a small flickering oil lamp guided her way. Asniah rowed her canoe slowly across the still lake. Floating homes, sparsely scattered on both sides, barely emerged from the shadows. Yet she kept paddling. There was no other choice. The mosque was the only place lit up, powered by a shared light from the villagers.

"It was really dark back then. The houses were far apart," Asniah recalled, speaking to journalists from *intuisi.co* and *prolog.co.id* in early May 2025.

Asniah frying snacks at her floating food stall. (Photo by Dadang Yono/Prolog.co.id)

Asniah wasn't originally from Muara Enggelam. She was born in Teluk Muda Village, Kenohan District, but had lived here since the early 1990s after her parents decided to move. The village is not only remote, it's completely cut off from land access and electricity.

Transportation is solely by water. Muara Enggelam lies at the confluence of the Enggelam River and Lake Melintang, surrounded by peatlands and swamps. There's not a single patch of solid ground. The village spans over 10,000 hectares and is home to 195 households, around 750 people.

All basic needs, food, health services, even just a block of ice, must be transported by motorboat for one to two hours from the nearest land town, Kota Bangun.

In the past, there was no electricity. Residents relied on kerosene lamps. The nightly soundtrack was the chirping of crickets, the rustle of water, and the whisper of the wind. It wasn't until the early 2000s that a few homes began using diesel generators.

But even then, only a handful could afford it. A generator required 15 liters of diesel, around Rp67,000, to run for 12 hours. Later on, the local government granted four neighborhood units in Muara Enggelam permission to manage shared generators. Each household paid a daily fee of Rp10,000, or about Rp300,000 a month.

These small power plants had limited capacity, only running from 6 PM to 6 AM. Even so, the machines weren't always reliable. When they broke down, repairs could take days. If too many households failed to pay their dues, the generators had to be shut down early due to fuel shortages.

There were other problems too: noise pollution from the generators rumbling through the night and thick black smoke blanketing the village.

"The important thing is, we're grateful. We've gone through tougher times. Back then, cities already had 24-hour electricity," said the mother of three.

The year 2015 marked a turning point. Tired of the noise and smoke from diesel generators, villagers in Muara Enggelam began considering solar power to meet their electricity needs. This solar power plant, known as PLTS, had an initial capacity of 30 kilowatt-peak (kWp), funded by the Ministry of Energy and Mineral Resources with a grant of IDR 3.4 billion.

Solar panels were installed atop a 15-meter-high wooden platform made from ulin, a Kalimantan hardwood as strong as steel, resilient in all conditions. The height was chosen to avoid flood damage, and the structure also housed the batteries and regulators.

For the villagers, solar energy was more than just light, it was a new life. Asniah experienced it firsthand. The transition from fossil fuel to solar energy made a big difference. A year after electricity became stable, she started a home business making amplang, a traditional East Kalimantan fish cracker. The belida fish, once ground by hand, could now be blended. No more worries about power outages or running out of fuel.

"I used to get anxious using a blender, one liter of fuel barely lasted an hour. Now, it's much more convenient," she said.

Stable electricity also brought internet access. Though slower than in cities, the connection was enough for WhatsApp and Facebook, two platforms that helped Asniah grow her business. She now sells *amplang*, runs a fried snack stall, and even started an online boutique four years later. Her fried snack business alone can bring in IDR 1 million a day. A small business she once never imagined is now thriving, thanks to sunlight.

"*Alhamdulillah*, things are so much easier now. It wasn't possible before," she added.

Asniah's story is not unique. She's part of a broader narrative the government is building through its "energy justice" program. Since 2017, the Directorate General of New, Renewable Energy, and Energy Conservation has spearheaded the Indonesia Terang (Bright Indonesia) program, targeting remote, outermost, and disadvantaged villages. By 2023, around 2,000 villages had gained electricity access, many through PLTS.

Muara Enggelam's PLTS development is a success story, though not without hurdles. These systems often face classic issues: poor maintenance, reliance on external technicians, and limited power supply. The village has experienced these challenges, but over the years, they've slowly become more self-reliant.

It's important to note: a 30 kWp capacity shared among more than 100 households means very limited power per home. High-wattage appliances like refrigerators are a luxury. Ice blocks still have to be purchased from the next village for IDR 3,000 each.

"If the village-owned enterprise (BUMDes) could handle this, we wouldn't have to buy from outside," Asniah said with hope.

She's not the only one benefiting from PLTS. All villagers share in the gains. But when it comes to business, it's a different story. One promising business idea, she said, is smoked fish, especially *lais* and *baung* [24].

The process takes two to three days using red mangrove wood, the only type that gives the right aroma.

"The smoked fish flavor only works with red mangrove. It can sell for IDR 250,000 per kilo here, and up to IDR 500,000 in Samarinda," said Asniah.

Behind the growing culinary trade, electricity pulses as the lifeblood of the village. Still, residents hope for more. With greater capacity, they could store food, make ice, or even open a boat repair shop or other small industries.

"From hundreds of thousands to just a few thousand, it makes a big difference. We hope to get more power in the future, and better internet too," she said.

Muara Enggelam: A village without land[25] *. (Desain by Yuda Almerio).*

24 Lais (*Kryptopterus spp.*) and Baung (*Hemibagrus spp.*) are freshwater fish species commonly found in major rivers in Indonesia, particularly in Sumatra and Kalimantan.

25 Muara Enggelam Village, with over 10,000 hectares of land, is home to 192 households and

Solar Power Sparks New Business Growth

Director of the Village-Owned Enterprise (BUMDes) of Muara Enggelam, Jam'ah, at her residence. (Photo by Dadang Yono/Prolog.co.id)

Jam'ah, Director of Muara Enggelam's Village-Owned Enterprise (BUMDes), explained that the local economy has significantly improved since the switch from diesel generators to solar power. Many small businesses have emerged, especially in recent years. One of the most popular is the ice-blended drink business, which wasn't feasible before due to the high electricity demand. Now, with the solar-powered PLTS, these ventures are thriving.

"Using generators was expensive, which is why few people started businesses. With the PLTS, the community now feels the relief," she explained.

In addition, fishermen now find it easier to go out at night. They no longer worry about lighting, as the rechargeable lamps last longer. Previously, they would break easily due to the unstable electricity supply from generators.

The solar power plant (PLTS) has also changed how residents process their catch. Fish can now be cleaned and processed at night, speeding up the production of Muara Enggelam's signature smoked and dried fish.

"It's easier to process the fish. Usually, right after catching, we start preparing it, either turning it into smoked fish or *amplang*. All of these steps need electricity. With generators, it's just too costly," she explained.

The salted fish from Muara Enggelam is not only sold in nearby cities but also reaches other parts of Indonesia, such as Banjarmasin, Jakarta, and Surabaya. Meanwhile, fresh fish are usually picked up directly by buyers from outside the village.

"For salted fish, we usually pack them in boxes before the collectors pick them up. I'm not sure if those from Java, like Jakarta or Surabaya, are sent abroad too," she added.

around 750 residents. Located at the confluence of the Enggelam River and Lake Melintang, the village is surrounded entirely by peatland and swamp—there is no solid ground. The main mode of transportation is by boat, though motorcycles are sometimes used on ulin wood paths during dry conditions.

According to her, economic improvement in the village began in 2015, the same year PLTS began supplying electricity. Over time, the local economy began to thrive. Businesses emerged, ranging from flavored ice and fried snacks to even bird's nest farming.

“But for us, these businesses are just side jobs. Everything still depends on consumer demand. Most of the residents here are fishermen. If the catch is good, then their purchasing power increases, which supports all businesses here," said the mother of one.

The PLTS system is fully managed by BUMDes, which handles the distribution of electricity and collects usage fees. The fees vary depending on what residents can afford: Rp3,000 for 300 watts/hour, Rp6,000 for 400 watts/hour and Rp10,000 for 700 watts/hour.

Fees are collected every 10 days. This system was designed to avoid overwhelming residents with large bills at the end of the month.

“Most people use the 300-watt plan. Only a few opt for the 400 to 700-watt options," she said.

So far, electricity sales from PLTS are BUMDes Muara Enggelam's biggest source of income. Monthly profits range from Rp10 to 14 million. Since electricity demand is consistent, annual revenue reaches at least Rp120 million.

“That said, sometimes profits are below average, because we have to pay monthly technicians, and sometimes panels need replacing. For special occasions like Ramadan, we even waive the electricity fees," she noted.

Jam'ah added that she is on standby 24/7 for PLTS-related issues. If residents face a problem, they usually call her directly, and she dispatches a technician to address it.

“I play a role here too," she laughed.

Thanks to the success of PLTS, five new business units have been launched: bird's nest farming, clean water supply, savings and loans, cable TV, and BRI-Link (a local banking agent). Among all, PLTS remains the most profitable. However, BUMDes only takes 15% of the profit. The rest is allocated as follows: 25% for village treasury, 5% for operational expenses, 9.5% for social funds (CSR), 0.5% for taxes and the remainder is reinvested

“The social fund is used to support community activities, school renovations, and medical assistance for sick residents," she explained.

Looking ahead, BUMDes plans to start a new venture: a cold storage unit accessible to all residents. This would help lower the cost of ice and enable villagers to store their catch. The plan is supported by the newly added PLTS capacity.

“Hopefully, we can make it happen this year," she said.

Affordable Electricity, Profitable Community. The solar power plant in Muara Enggelam has lowered electricity costs and generated profit for the village. BUMDes reinvests earnings into community businesses, expanding into five new sectors including bird's nest farming and local banking agent. (Desain by Yuda Almerio).

Managing Solar Energy Independently

Like a wish come true, BUMDes Muara Enggelam's business expansion plans received a boost at the end of 2024. The village secured an additional 23.1 kWp of solar capacity, supported by a Rp4.5 billion grant from the Kutai Kartanegara (Kukar) district government. This project cost more than previous ones, primarily due to the use of lithium-ion batteries, which store energy more efficiently than the tubular gel batteries used in the village's first solar project.

"We've expanded our solar capacity four times now, funded through regular community contributions and government support. Since our village

is often chosen as a national model, we regularly receive development grants. The most recent upgrade came from the Kukar district government late last year," said Jam'ah.

Muara Enggelam Village Head, Madi, explains the components of the solar power system (PLTS) installed in his village. (Photo by Yuda Almerio/Intuisi.co)

Through this community-managed system, the PLTS (Solar Power Plant) in Muara Enggelam has grown significantly—from an initial 30 kWp in 2015 to 80 kWp today. This increased storage capacity ensures that electricity can continue to flow to all 195 households, even during three consecutive days of cloudy weather.

"It once rained for two days straight, but our electricity remained stable, no issues at all," Madi affirmed.

Long before Muara Enggelam became a national role model for communal solar power systems (PLTS), its journey began with a series of pivotal events dating back to 2010. At the time, residents were growing increasingly frustrated with the constant noise of diesel generators, the resulting pollution, and the rising cost of fuel.

The villagers voiced their plea for consistent electricity like that in neighboring villages. Their concerns were brought to the subdistrict's development planning forum (Musrenbang) by then-village head Johar.

"But realistically, PLN (the state electricity provider) couldn't possibly reach us. That's when the idea of a centralized solar power plant, not household-based—was born," recalled Madi, who at the time served as the village treasurer.

The proposal was initially submitted to the Kutai Kartanegara Regency Government but was met with rejection, as was the case at the provincial level. The primary concern was cost—developing a PLTS wasn't cheap. Undeterred, the villagers reached out through broader networks and eventually sought support from Indonesia's Ministry of Energy and Mineral Resources (ESDM). Four years later, their proposal was approved.

Initially, the 30 kWp solar plant was intended to serve just 30 homes. But this plan was rejected locally as unfair, fearing it would breed jealousy. The village opted instead for equitable access: electricity for all 195 households, even if each received less.

"The idea was simple, even if the power is limited, at least every house has light. So we capped each home at 350 watts," said Madi.

The solar system was tested for a full month without charging the residents. It succeeded, every household bulb stayed lit for 24 hours without issue. This prompted the village government to call a community meeting to discuss tariff options and usage regulations.

But reaching consensus wasn't easy. Many residents initially rejected the idea of paying for electricity, arguing that sunlight was free and the system itself was government-funded. Why should they pay?

"The community wanted everything to be free. But the former village head insisted on setting tariffs, reminding everyone that maintenance and repairs also cost money. If not from the tariff, then from where?" Madi explained.

After long discussions, a compromise was reached. The agreed-upon fees were much lower than the cost of diesel generators and scaled according to residents' financial capacity. The minimum daily rate was Rp3,000 for 350 watts.

Just as the system was running smoothly, another issue emerged: power outages. The village administration investigated, confused by the sudden disruptions despite equal distribution. They discovered the cause, electricity theft. No fewer than five residents had been siphoning power illegally. The matter was settled amicably.

"They all signed a statement promising not to do it again. If they did, their electricity would be cut off permanently," Madi stated firmly.

The False Hope of Energy Transition in East Kalimantan[26] . (Desain by Yuda Almerio)

The Illusion of Energy Transition

The East Kalimantan Provincial Government has officially set an ambitious target: 12.39% of its energy mix should come from renewable sources by 2025, nearly tripling to 28.72% by 2050. This target is outlined in Regional Regulation No. 8/2019 concerning the Regional General Energy Plan. However, in practice, the province remains one of Indonesia's major coal production hubs.

East Kalimantan also hosts the highest number of coal-fired power plants (PLTU) in the country, 26 units in total. Rather than curbing carbon emissions, these power plants continue to proliferate under the pretext of powering national strategic projects.

26 Despite talks of energy transition, East Kalimantan still has 110 villages without electricity, according to the regional Energy and Mineral Resources Office (ESDM). JATAM (Mining Advocacy Network) criticizes the contradictory policy, which promotes transition on one hand, while simultaneously reinforcing dependence on highly destructive coal energy.

Despite written commitments to energy transition, the reality on the ground in East Kalimantan reflects a stalled shift. Coal-fired plants still dominate the energy mix, while clean energy initiatives, like solar, biogas, or hydro, remain limited in scale and scattered in implementation. In many cases, they are initiated by grassroots communities or village-owned enterprises (BUMDes) like in Muara Enggelam, rather than by the state.

"Community involvement is crucial. They're the first to feel the impact of the energy crisis, and often the first to propose alternative solutions," said Mareta Sari, Director of the East Kalimantan Mining Advocacy Network (JATAM).

Still, beyond Muara Enggelam's success story, other issues loom. Mareta believes the government should stop lulling the public into complacency with narratives of a so-called energy transition. She pointed out the rise of captive *coal-fired power plants*, built specifically to power industrial operations like nickel smelters, as a step backward in Indonesia's decarbonization efforts.

"This false transition only prolongs the life of dirty energy. In East Kalimantan, we've seen critical habitats destroyed by coal mining, and in eastern Indonesia, communities are displaced in the name of downstream industrialization," said Mareta, who is familiarly known as Eta.

Eta referenced Presidential Regulation No. 112/2022 on the Acceleration of Renewable Energy Development for Electricity Supply. This policy ironically permits the construction of new coal plants for strategic industries like nickel. Even as the government promises early retirement for 13 PLN-operated PLTUs with a total capacity of 4.8 gigawatts, Mareta argued that policy implementation remains stagnant.

"It's contradictory. On one hand, they talk about transition, but on the other, they're doubling down on coal dependency to support highly destructive industries," she stressed.

She also cautioned against embracing the term "energy transition" too hastily. For Eta, a true transition must go beyond rhetoric, it must protect communities' living spaces and put an end to long-standing environmental destruction.

"A just transition must address both social and ecological impacts holistically. And in East Kalimantan, the government's clean energy narrative is full of contradictions," she said.

Eta further criticized how energy transition efforts in the province are still rooted in extractivism. Forests are cleared for mining roads and power plants, farmland is seized, coal dust pollutes the air, and clean water grows increasingly scarce. All of this, she argued, is the result of a state more focused on GDP growth than ecological recovery.

“How can we talk about renewables while still allowing forest conversion for industry?" she said sharply. “Most of our policies are out of sync with climate crisis mitigation. If people's living spaces are still being sacrificed, this isn't a transition, it's a power grab."

For Eta, there's a quiet irony in Muara Enggelam's PLTS success. Do residents fully understand where their solar panels come from? Are they aware of how hazardous waste from broken components is managed?

“Those are questions that people should have answers to. Unfortunately, that kind of information is still far out of reach for communities who live with daily electricity shortages," she added.

Mareta also criticized the national energy transition strategy, saying it's too obsessed with large-scale investment and mega-projects instead of listening to the needs of local communities. While the government allows the unchecked growth of captive PLTUs under the banner of industrial downstreaming, villages like Muara Enggelam are left to fend for themselves, drafting village regulations, collecting fees, even paying technicians from their own community funds.

“In the end, it's always the same things being sacrificed, forests, water, and people's homes," she said. “A just energy transition must stop sacrificing rural villages for the benefit of the mining industry."

A Portrait of Muara Enggelam Villagers Escorting Their Children to School (Photo by Dadang Yono/Prolog.co.id)

The Ambition to Bring Light to Remote Areas

East Kalimantan, known as a national energy hub, holds a striking irony. Amidst its rich natural resources, there are still 110 villages shrouded in darkness, completely without electricity. According to data from the East Kalimantan Department of Energy and Mineral Resources (ESDM), 74 of these villages remain potentially reachable by the state electricity company (PLN). However, 36 villages are truly isolated, separated by rough terrain and limited road access.

Amid these limitations, renewable energy has emerged as a new beacon of hope. From deep forest enclaves to remote riverbanks nearly forgotten, the potential of solar, biomass, and micro-hydro energy is being explored as a solution to the persistent electricity gap.

"Actually, the 36 villages categorized as 3T (disadvantaged, frontier, outermost) areas have been prioritized for acceleration programs. But we need to coordinate with PLN, if there's no plan for PLN to enter within five years, then we'll step in," said Sonny Widiagara, Junior Policy Analyst for Renewable Energy and Energy Conservation at the East Kalimantan ESDM Department.

Solar power development programs in some inland regions are beginning to yield results. Villages once lit only by oil lamps are now enjoying electric lights powered by solar energy. Beyond saving fuel costs, solar power also opens up new economic opportunities for local residents.

However, Sonny notes that realizing the energy transition in isolated areas comes with its own set of challenges. Limited supporting infrastructure, logistical difficulties, and the lack of trained human resources to operate and maintain power plants remain the primary obstacles.

"The challenge is mostly geographic, especially when it comes to places like Mahulu. Transporting equipment is tough, and so is monitoring the systems. On the community side, sometimes after they finally get electricity, they immediately buy too many electronics, which creates more load than what the original system was designed for," he said.

Another ongoing concern is sustainable maintenance. The ESDM office can no longer support operations or conduct upgrades once the solar plants are handed over to local governments, as full authority is transferred to them.

"We hope that after the installations are complete, the district governments will support the budget for maintenance," Sonny added.

Meanwhile, the provincial government continues to push for renewable energy-based electrification as a long-term solution, not only to meet national energy mix targets but also to ensure every corner of East Kalimantan enjoys the basic right to electricity.

To achieve the 12.40% renewable energy mix target by 2025, the provincial government has designed several strategies. One of them is building solar power plants (PLTS) in remote villages, for example, the centralized PLTS in Menamang Kanan Village, Muara Kaman, which has a capacity of 87 megawatt-peak (MWp) and can light up around 600 households. This program is planned to expand gradually with the construction of 124 additional PLTS units.

In addition, East Kalimantan has substantial potential in biomass and biogas—estimated at around 936.14 MW and 150 MW, respectively. Utilization of these energy sources is expected to drive the achievement of the region's renewable energy goals.

"The central government is targeting an even higher figure for East Kalimantan in 2045, around 79%. But we're still waiting for elaboration from them, it will certainly be closely tied to national programs," he said.

Sonny went on to explain that East Kalimantan's economic transformation strategy, which follows the framework of an energy transition, aligns with the national renewable energy target of 23% by 2030. Moreover, the use of biofuel has become mandatory in the mining sector, which remains a backbone of East Kalimantan's economy.

"Indeed, most of the contribution to the national energy mix comes from the central government. So, in a way, we're helping accelerate the central government's goals. For instance, in East Kalimantan, mining operations are now mandated to use biofuel," he concluded.

Muara Enggelam Village serves as a powerful example: from a remote place once in darkness and neglect, it has now become a beacon of a fairer, more sustainable energy transition. With the hands of its people and the power of the sun, this landless village has emerged as a frontline pioneer of renewable energy.

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https://intuisi.co/mendulang-cuan-dari-dampak-baik-transisi-energi/
https://prolog.co.id/mendulang-cuan-dari-dampak-baik-transisi-energi/

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Kindled by Unity: Education Rises on the Edge of the Sea

by Ismu Samadhani

Under the dim glow of a 5-watt bulb in his home, Rasrin begins his evening study session. A student at SMAN 1 Batu Atas, one of the first senior high schools on Batu Atas Island, located in Taduasa Village, Batu Atas Subdistrict, South Buton Regency, Southeast Sulawesi (Sulawesi Selatan/ Sultra), Rasrin is used to studying by flashlight. Until 2018, a solar power plant (PLTS) brought a new glimmer of hope.

Rasrin can now study under the bright light of her home as she pursues her dream of becoming a nurse. (Photo by Ismu/Sultratop.com)

The clock strikes 9 p.m local time, yet the Indonesian language textbook remains firmly in Rasrin's hands. She is reviewing the day's lesson from school. Occasionally, her fingers dance across the screen of her phone as he browses the internet.

Batu Atas Island is categorized as a disadvantaged, frontier, and outermost region in Southeast Sulawesi. Since childhood, Rasrin has dreamed of becoming a nurse. But the lack of electricity access once dimmed that ambition. Before electricity reached her home, she studied under the flicker of a kerosene lamp or relied solely on a flashlight.

"It was difficult to study. Sometimes I had to hold the flashlight with one hand," he recalled.

Her hopes reignited when a solar power plant arrived in the village in 2018. Electricity began flowing into her home, and soon after, Rasrin's family purchased a small-capacity battery for IDR 300,000.

In addition, internet access only became available in 2021. Although the connection was far from fast, it offered new hope for Rasrin to gain access to information and knowledge.

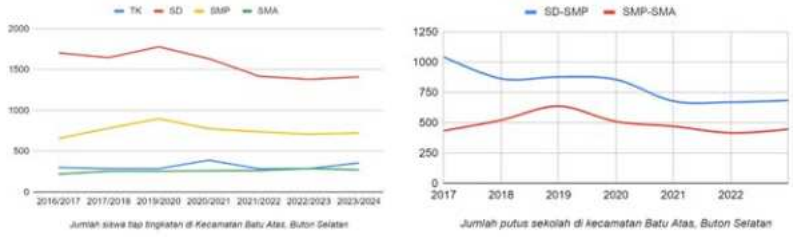
"Yes, the signal used to be really difficult. Unless we went up the mountain, only then we could get a connection," Rasrin said.

She began to experience stable internet in 2023 after a large network tower was built. Since then, Rasrin has regained her enthusiasm to study, driven by her dream of becoming a nurse. She now explores various reading materials and educational videos online, just like she did on Thursday night, March 20, 2025.

Electricity and Internet Access Drive Up School Attendance

SMAN 1 Batu Atas, one of the schools with limited electricity. (Photo by Ismu/Sultratop.com)

According to data from the Batu Atas District Statistics Agency (BPS) from 2017 to 2024, the number of students continuing to junior and senior high school had been steadily declining since 2017. In the 2016/2017 academic year, the number of elementary and middle school students dropped significantly, from 1,706 to just 783. However, from 2018 to 2023, the decrease slowed to only about 6%.



Student Enrollment and Dropout Trends in Batu Atas, South Buton (Source: Batu Atas District Statistics Agency (BPS) [27].

27 The number of students in Batu Atas District, South Buton, has fluctuated across all education levels between 2016 and 2024. While elementary school (SD) consistently recorded the highest enrollment, there was a notable dip after the 2019/2020 academic year. Meanwhile, dropout

Before the government-subsidized solar power (PLTS) arrived, SMAN 1 Batu Atas was one of the few schools with limited access to electricity. “The school took the initiative to set up its own PLTS for electricity needs. It was funded through contributions from the school and students' parents in 2017," said Supiadi, the principal of SMAN 1 Batu Atas. Previously, they had built a small generator and battery system on their own.

“The capacity was just enough to power some lights," he added. For Supiadi, the government's push for digital learning facilities felt unrealistic in their context. Even to submit school data, teachers had to travel six hours by sea to reach Baubau City. Still, they never gave up.

They also invested in a basic internet network using Ubiqu equipment. The effort paid off. Despite limited electricity and internet, SMAN 1 Batu Atas successfully held its first online-based exam. All 70 students who took the test passed, 100% success rate.

In 2018, the government constructed the first PLTS on Batu Atas Island. According to data from the Southeast Sulawesi Energy and Mineral Resources Agency (ESDM), five PLTS units were built in the villages of Wambongi, Batu Atas Barat, Taduasa, and two in Tolando. The development was funded by the national EBTKE[28] budget and is now managed as a district asset.

However, these PLTS units didn't cover the entire island, including SMAN 1 Batu Atas. Located in Taduasa Village, about 5–6 kilometers from the closest PLTS site, the school was left without a power connection.

Determined to find a solution, Supiadi again pushed for an independent PLTS at the school. Parents and teachers gathered once more, and the school formally requested help from the provincial government. When no assistance arrived, they opted to expand their generator capacity.

Eventually, the school purchased its own PLTS system through a cost-sharing scheme, funded by parent contributions and the government's School Operational Assistance (BOS) program. The process was gradual, beginning with solar modules and 7,000-ampere batteries. By 2020, the dream of having their own solar power system had come true.

“It's just enough for lighting and a few digital devices," Supiadi said.

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rates remain concerning—especially during the SD to SMP (junior high) transition, which saw over 1,000 students dropping out in 2017 and continuing at high levels through 2022. These figures highlight persistent barriers to education access and retention in remote island areas.

28 EBTKE stands for Energi Baru, Terbarukan, dan Konservasi Energi. It is the Indonesian term for the Directorate General of New, Renewable Energy and Energy Conservation, a part of the Ministry of Energy and Mineral Resources.

Thanks to the PLTS, learning activities have continued smoothly, even though the internet connection remains inconsistent. The school now plans to budget for 10 additional modules and 2 more batteries.

Student interest in continuing their education has also shown significant growth. In 2024, a second high school, SMAN 2 Batu Atas, was established in the district. Acting Head of High School Development at the Southeast Sulawesi Department of Education, Ila Nasrah, confirmed the increasing number of students advancing to higher education levels.

She continues to push for educational equity across the region, including in Batu Atas Island and other 3T (disadvantaged, frontier, outermost) areas. One initiative involves securing a New School Unit (USB) grant in 2025 for SMAN 2 Batu Atas.

"This is one of our efforts to ensure children can access education with proper facilities," said Ila.

At its inception, SMAN 2 Batu Atas enrolled 20 students. Ila emphasized that with the population of South Buton Regency recorded at 12,821 people by BPS, one senior high school alone was not sufficient.

No Government Support, Solar Power Plant in Danger of Stalling

Dewi Rosaria Amin, Head of the Renewable Energy Division at the Southeast Sulawesi Provincial Energy and Mineral Resources Office (Photo by Ismu/Sultratop.com).

Head of the Renewable Energy Division at the Southeast Sulawesi Provincial Energy and Mineral Resources Agency (ESDM), Dewi Rosaria Amin, stated that the investment cost for solar power plants (PLTS) is relatively high, especially when it involves basic needs in remote areas. For example, the cost of building a PLTS can reach IDR 150 million per kW. Thus, for a PLTS like the one in Taduasa Village with a capacity of 65 kW, construction costs could total up to IDR 9.7 billion.

According to ESDM Southeast Sulawesi data, there are 217 PLTS units established in the region since 2015, consisting of 113 centralized PLTS, 100 distributed PLTS, and 4 rooftop PLTS. These 217 units supply electricity to over 300 villages, benefiting a total of 23,545 households.

In addition to powering households, each village also utilizes solar energy for 5–10 public facilities such as schools, auxiliary health centers, mosques, and village offices.

Taduasa Solar Power Plant (PLTS), one of the three centralized government-built PLTS still operating on Batu Atas Island. Constructed in 2018, this facility currently supplies limited electricity to 250 households in Taduasa. (Photo by Ismu/Sultratop.com)

Unfortunately, there is no maintenance funding support from the central government. The provincial government can only allocate IDR 400 million for maintaining the centralized PLTS in Taduasa Village under the 2025 regional budget (APBD).

"Many are no longer operational, some operate but not optimally, and a few still run. PLTS have technical limitations, especially the batteries which last a maximum of five years and inverters that can break down if struck by lightning," said Dewi.

Aspek	PLTS	PLTB	PLTBg
Efisiensi Konversi	15-22%	30-45%	80%
Ketergantungan Alam	Intensitas cahaya matahari	Kecepatan dan konsistensi angin	Limbah peternakan sekitar
Biaya Investasi Awal	Lebih rendah	Lebih tinggi	Bervariasi sesuai lokasi, teknologi dan kondisi lapangan
Produksi Energi	Stabil di siang hari	Variatif tergantung angin	Tergantung bahan baku
Potensi Hibridisasi	Tinggi	Tinggi	tinggi

Comparison Table of Renewable Energy Sources: Solar (PLTS), Wind (PLTB), and Biogas Power Plants (PLTBg)[29] . Source: compiled.

29 This table compares three types of renewable energy power plants—Solar (PLTS), Wind (PLTB),

Asminar, researcher at Halu Oleo University Kendari. (Photo by Ismu/Sultratop.com)

Meanwhile, researcher Asminar from Halu Oleo University in Kendari mentioned that Batu Atas Island has considerable renewable energy potential, including solar (PLTS), wind (PLTB), geothermal, wave energy, and others. "In terms of cost, solar power is indeed the most economical," she said.

She added that due to the large electricity demand, the government should consider energy integration (hybrid systems). "The Banda Sea has high wave energy potential, right? Though costly, there's a real opportunity to harness wave energy for electricity generation, either from the coastline or offshore. This should be proposed to the government so it can be combined with solar energy," Asminar explained.

The advantage of hybrid systems, she noted, lies in their ability to compensate for each other's shortcomings, leading to a more stable and efficient electricity supply. In her research on modeling coordination between renewable power plants and battery systems, hybrid models combine primary sources such as PLTS and PLTB in parallel with a main battery.

"If you combine the energy sources, the output can be much greater. For instance, I once worked on a hybrid system that used solar, wind, and biogas energy from cow manure. Since solar energy is available from 6 AM to 5 PM, wind energy covers the remaining hours. At its peak, wind can even produce more electricity," she said.

Meanwhile, biogas plants (PLTBG) serve as a support system with backup batteries that kick in when the main battery weakens or disconnects from the load. Combining two or more energy sources like this is a concept known as a hybrid microgrid.

This system is seen as a solution for developing energy-independent zones using locally available renewable energy sources. Its scale isn't limited to a single remote village, the amount of energy generated could support other facilities, such as schools and public infrastructure.

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and Biogas (PLTBg)—across several key aspects. While biogas power offers the highest conversion efficiency (up to 80%), its energy output depends on local feedstock availability. Solar energy provides stable output during daylight hours and has lower initial investment costs, but is limited by sunlight intensity. Wind power is highly efficient but dependent on wind speed and consistency. All three sources have strong potential for hybrid systems, offering flexible solutions to meet local energy needs.

Though state electricity (PLN) has never fully reached the area, Headmaster Supiadi said the school and parents' initiatives remain strong. "That hope," he said, "has never dimmed."

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Half-Lit Hopes: Batu Atas and the Flicker of Solar Power

by Ismu Samadhani

Batu Atas Island is a tiny dot in the southern part of Southeast Sulawesi, precisely located in Batu Atas District, South Buton Regency (Busel). For years, the residents of Batu Atas have lived in darkness. Amid these limitations, they have relied on mutual cooperation to bring light into their lives. Dim as it may be, it's been just enough to keep going. In 2018, the government introduced Solar Power Plants (PLTS), offering only a small breath of relief.

Wa Ode Mida's nighttime activities often require the help of a flashlight. Nevertheless, she remains grateful for the electricity from the solar power system she managed to obtain through her own hard work. (Photo by Ismu/Sultratop.com)

At seven in the evening, Wa Ode Mida (50) switches on three lightbulbs in her home. The dim glow in her house only became accessible in December 2024. It didn't come for free, electricity in her home is the result of years of personal savings.

"Sometimes I would prepare pre-dawn meals in the dark, because the lights had already gone out. I had to use a flashlight," she said with a deep sigh when met at her home on Saturday (March 22, 2025).

Wa Ode Mida has long lived alone in Batu Atas Timur Village, Batu Atas Island, after her husband passed away and her child left the island to pursue a university education. The island itself is only slightly larger than Soekarno-Hatta International Airport in Jakarta, covering approximately 8.3 square kilometers. It comprises a single district with seven villages.

Each day, she takes on whatever work she can find, helping local fishermen sell their catch, working as a construction laborer, even hauling stones from her small garden plot. She scrimped and saved to buy basic solar panel components from Baubau City, reachable only after a six-hour sea journey, just to experience what it feels like to live under a steady light.

"I spent Rp2.8 million on it in Baubau. I installed it on the roof. But it really depends on the weather, these three bulbs sometimes don't last long. Just this dim, if the weather isn't too hot. You know how it is," she said.

Batu Atas Timur Village, where she lives, is one of three villages on the island still without access to electricity from the government's solar power program since its rollout in 2018. Batu Atas Island is home to seven villages: Batu Atas Timur, Batu Atas Barat, Batu Atas Liwu, Taduasa, Tolando Jaya, Wacuala, and Wambongi.

Wa Ode explained that the lights in her home remain faint because the battery she uses only has a 50 Ah (ampere-hour) capacity. On sunny days, she can use electricity from her solar unit from 7 p.m. to 1 a.m. But if sunlight is lacking, the electricity can cut out suddenly, without warning.

Despite the dim light, Wa Ode says the solar power system has made a real difference in her life. She no longer needs to spend as much on kerosene for oil lamps. In the past, she spent Rp220,000 every week to buy 20 liters of kerosene. Now, that same amount can last her a whole month, used instead to buy battery water.

"If I use oil lamps, the house gets filled with smoke. The smoke is like exhaust fumes, makes your eyes sting. But now, even if it's just a little, at least we can enjoy having electricity," she said under the soft glow of her dimly lit home.

Solar Panels as an Extra Breath of Life

La Ngape, the manager of the Taduasa Solar Power Plant (PLTS), stated that the centralized PLTS built by the government can only supply limited electricity, just enough to power a few light bulbs per household. (Photo by Ismu/Sultratop.com)

Since 2018, the government has gradually built Solar Power Plants (PLTS) on Batu Atas Island. Data from the Southeast Sulawesi Energy and Mineral Resources Agency (ESDM Sultra) shows that five centralized solar plants have been constructed in the villages of Wambongi, Batu Atas Barat, Taduasa, and two in Tolando. These facilities were funded through the national budget (APBN) under the Directorate General of New and Renewable Energy (EBTKE) and are now under the ownership of the district government.

However, these solar plants still fall short in reaching the entire island population. Electricity was only installed for 1,076 households registered at the time of construction. Other villages, Batu Atas Timur, Batu Atas Liwu, and Wacula, continue to rely on oil lamps, diesel generators, or privately purchased solar systems for lighting.

The PLTS facility in Tolando Jaya has since ceased operations after its inverter was struck by lightning. As a result, the 530 previous connections, including newly built homes, have reverted to using oil lamps, generators, or personal solar units.

Batu Atas sub-district head, Faharudin, observed that despite the government's installation of centralized PLTS, it has brought little economic change to the island. The main benefit, he said, is limited to household lighting.

"The economic impact of the PLTS is minimal. The only noticeable improvement is that people no longer have to spend money on kerosene for traditional lamps," he stated.

Solar Ice Brings Profit to Fishermen

On Batu Atas Island, fishing is a way of life dictated by the rhythm of nature. La Ode Ali Hamsah (42), a resident of Batu Atas Timur, once depended entirely on favorable weather to head out to sea. If the waves were calm, he'd eagerly set off in his motorboat to fish. If conditions were rough, he stayed home for safety.

His catch could only be sold on the island due to its remoteness, six hours by sea from Baubau City. The income was meager: sometimes Rp100,000 a trip, sometimes less. After subtracting fuel and household expenses, there was little left. Compounding the problem, many others also fished for a living, leading to stiff competition and limited demand.

La Ode Ali Hamsah, a resident of East Batu Atas. (Photo by Ismu/Sultratop.com)

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"We only go out for short trips, maybe two or three hours," Hamsah said.

Without ice or cold storage, unsold fish would spoil quickly. Not for lack of money, but because the island lacked the electricity needed to power refrigeration.

Now, however, Batu Atas fishermen are catching a break. A local resident, Chandra Mustika Ady of Batu Atas Timur, has built a cold storage facility powered entirely by solar energy. Thanks to this facility, Hamsah can fish for longer hours and sell his catch at Chandra's storage center.

On a good day, Hamsah now earns over Rp200,000, enough to support his family and pay for his six children's education.

Chandra independently installed a 5,000-watt solar panel system at his home. Drawing from his past experience working as a shipping agent in Batam, he returned to Batu Atas with a mission: to build a cold storage facility and help local fishermen sell their catch in Baubau.

Mustika Ady (right) shows several tools used in the ice-making process for storing his fish. (Photo by Ismu/Sultratop.com)

"I started with just 450 watts. I built it myself, bought a 100 Ah battery in Baubau, hand-wound the transformers, and assembled all the components myself. I used it for two years while saving up," he explained.

Today, he runs six refrigerators to make ice blocks for preserving fish. The system cost about Rp150 million in total, including four batteries, each with a capacity of 4,800 Ah.

"It produces 5,000 watts when the sun is good. On cloudy days, I shut the fridges off. Sales drop when it rains since people don't buy ice. Ice sells best when it's hot out, people get thirsty. But I prioritize the ice for fish," Chandra said.

He buys fish from local fishermen to sell in Baubau, adjusting purchases based on market demand. For example, mackerel under 3 kg sells for Rp10,000–12,000/kg, while those over 3 kg fetch Rp15,000–17,000/kg, much higher than local prices.

Since the cold storage facility opened, fishing enthusiasm on the island has risen dramatically. Now, it's a daily activity. With higher incomes, the fishermen can better support their families.

On average, 100 kg, about two boxes, of fish are shipped to Baubau daily. In peak seasons, shipments rise to five boxes. In low seasons, Chandra waits until at least one box is full before sending it off.

Marjumagus, Head of the Aquaculture and P2HP Division at the Southeast Sulawesi Marine and Fisheries Department (DKP Sultra)

Marjumagus, Head of the Aquaculture and P2HP[30] Division at the Southeast Sulawesi Marine and Fisheries Department (DKP Sultra), stated that the waters surrounding Batu Atas Island have immense potential for capture fisheries. However, limited electricity supply has prevented the development of proper fish storage facilities.

According to data from the South Buton DKP, in 2023, Batu Atas Island had 657 fishing households (RTP), producing 3,071,520 kilograms of catch across 20 fish species. This figure increased in 2024 to 788 RTP, with a total catch

30 P2HP refers to Pengolahan dan Pemasaran Hasil Perikanan. A division (Aquaculture and Fishery Product Processing and Marketing Division) under the Marine and Fisheries Agency that is primarily tasked with preparing policy formulation materials and providing technical guidance in the field of aquaculture, as well as developing business, logistics, processing, and marketing of fishery products.

of 3,253,208 kilograms, still from the same 20 species.

To improve the marketing of fish catches from Batu Atas and South Buton in general, DKP Sultra is pushing for the development of a Fish Landing Base (PPI) dock in Sampolawa, a district in South Buton located on Buton Island.

"If we already have the PPI, then boats can dock there, right? It will also be equipped with cold storage and other essential facilities. Once that's in place, industrial vessels from around Southeast Sulawesi can come and buy fish there, and companies can collaborate with those who own the cold storage," Marjumagus explained.

In fact, funding for the PPI construction in Sampolawa had already been allocated through the Special Allocation Fund (DAK) with a budget of approximately Rp20 billion, targeted for implementation in 2025. However, the funds were retracted by the central government, despite the project already being included in the official budget document (DIPA). Marjumagus expressed hope that by 2026, the state's financial condition will improve so that the PPI construction can proceed.

Back in 2016, aid was provided to Batu Atas fishermen from the Ministry of Maritime Affairs and Fisheries, facilitated through identification by the Southeast Sulawesi provincial government. In response to ongoing complaints from Batu Atas fishermen, Marjumagus stated that the province is committed to taking further action.

"Moving forward, the Southeast Sulawesi Provincial Government will pay closer attention to outer islands like Batu Atas," he said.

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Light at the Edge of the Nation

by Maria

The Cross-Border Post (PLBN) in Temajuk Village, Sambas Regency. (Photo by Maria/ SUARAKALBAR.CO.ID).

Temajuk Village, located in Paloh District, Sambas Regency, West Kalimantan, no longer lives in darkness. Thanks to the collective efforts of its residents and the arrival of a Solar Power Plant (PLTS) in 2023, the village now enjoys 24-hour electricity. As a result, its once-hidden coastal charm is beginning to shine, with tourist visits increasing each year.

Situated about 370 kilometers from the capital of West Kalimantan and 146 kilometers from Sambas' regency capital, Temajuk is categorized as a 3T (disadvantaged, frontier, outermost) region. Yet, the village holds immense natural tourism potential.

Often dubbed "a slice of paradise at the tail of Borneo," Temajuk offers a wide range of coastal and tropical rainforest attractions, including Camar Bulan Beach, Teluk Atong Bahari Beach, Asam Jawe Pier, the Tanjung Datu' Rainforest, Dua Kelapa Island (also known as Batu Nenek), and many others.

A glimpse of the guest rooms at the Atong Bahari Bay tourist destination. (Photo by Maria/ SUARAKALBAR.CO.ID).

Back in 2009, Rasad, a local tourism pioneer, recognized the potential of Temajuk as a tourist destination. However, at the time, the village had no access to electricity. Driven by determination, he launched a small lodging business with support from the Ministry of Maritime Affairs and Fisheries (KKP), constructing a single guest room. Alongside his wife, Jasminah, he has managed the guesthouse independently ever since.

Portrait of Rasad, also known as Ning Atong, a tourism advocate and owner of a guesthouse in Temajuk Village, Sambas. (Photo by Maria/[SUARAKALBAR.CO.ID).

Rasad, known fondly as Ning Atong, was initially dismissed for his idea to promote Temajuk as a tourism hub. The odds were stacked against him. Not only was Temajuk part of the 3T (disadvantaged, frontier, outermost) regions, but it also lacked basic infrastructure like proper roads, let alone a reliable power grid. Atong recalls that around 2009, local residents received a government aid

package consisting of a solar panel complete with battery and installation. But it could barely power three lightbulbs, far from sufficient to run a lodging business.

"In the end, we used diesel generators. Even then, not every house had one, only a few did," said Jasminah, recalling their early struggles.

Running a guesthouse in a place with limited electricity was no easy feat for Atong and his family. Jasminah shared how they often received complaints from guests due to the frequent power limitations. Things got worse when their diesel generator would break down without warning.

"There was a time the machine broke down and the guests complained. So when that happens, we have to fix it immediately, whatever it takes. If it breaks today, it must be fixed by tomorrow," said Atong.

To help cover household and maintenance costs, including repairs and cleaning needs, Jasminah also offered catering services to guests staying at their lodge.

Half-Hearted Electricity Access

In 2013, a solar power plant (PLTS) owned by Indonesia's state utility company PLN was established in Temajuk. With a modest capacity of just 80 kilowatts (kW), it could only supply power to roughly 300 households, half of the village's 600 homes. Even then, each household's electricity usage was limited.

The situation wasn't much better on the ground. Frequent blackouts meant residents often had to rely on dim lighting powered by private diesel generators.

In 2014, a diesel power plant (PLTD) was introduced to the village, bringing a glimmer of hope. But it could only supply power at night, from 6 p.m. to 6 a.m local time. Outside those hours, Atong's family had to depend on fuel-hungry, breakdown-prone generators, often drawing complaints from their guests.

PLTS of Temajuk Village, Sambas. (Photo by Maria/SUARAKALBAR.CO.ID).

"Every morning, I'd help my husband turn on the generator and keep it running until dusk. There was even a time when a guest shouted in frustration because there was no water for bathing," Jasminah recalled.

A thesis titled *Tourism Development Strategy for Temajuk Village, Paloh District, Sambas Regency* by Aan Khosihan noted that in 2009, electricity availability in the village had temporarily improved to 14 hours a day. However, the supply remained unstable, with frequent outages, especially at night. Once again, residents were forced to find workarounds, often through expensive diesel-powered generators.

"This issue has often led accommodation providers to charge higher rates," the thesis stated.

A Struggle That Paid Off

Atong's persistence has had a lasting impact on Temajuk. What started as a single guest room has grown into a business with 36 rooms. Atong is now regarded as the pioneer of Temajuk's tourism scene and currently manages Teluk Atong Bahari Beach, one of the village's top attractions.

He keeps a logbook of every guest, local and international. These records serve as evidence to convince potential investors. His investment model is simple: investors build, Atong manages, and later buys back the property once he's financially ready.

His long struggle finally bore fruit. On Indonesia's 78th Independence Day in 2023, PLN officially launched a 371 kWp solar power plant in Temajuk, equipped with a 708 kWp battery and a 310 kW backup diesel generator. Located near the coast and residential areas, this new facility brought 24-hour electricity to the village for the first time.

Now, with uninterrupted electricity, Atong's business has been revitalized. Guests are more comfortable, and his accommodations run smoothly without the fear of generator failures.

"We used to scramble with generators late at night. Now it's such a relief," said Jasminah.

The stable power supply has also boosted tourism, attracting both local and international visitors, including some from Germany. Atong noted that tourists don't just come for the beach; many are intrigued by the feeling of being at Indonesia's outer edge.

"The PLTS has been a game-changer. More tourists are coming, and now that the roads have improved, they're staying longer too," Atong said with visible relief.

Electricity costs for Atong's family have also dropped significantly. Jasminah estimated a 50% reduction in their energy expenses.

"Back then, it wasn't just about the fuel; we also had to replace broken parts all the time. We've replaced three generators over the years, and they weren't small machines," she explained. Their last generator is now kept as a backup in case of outages.

Today, Atong's tourism business is thriving. He has managed to build several lodgings with his own capital and even turned down new investor offers.

"Some investors offered to build more accommodations, but I told them not yet," he said.

One of the beach views in Temajuk Village, Sambas. (Photo by Maria/SUARAKALBAR.CO.ID).

This growth was on full display during the 2025 Eid holiday season. All of Atong's rooms, priced between IDR 250,000 and IDR 650,000 per night, were fully booked from the third to the tenth day after Eid. He wasn't alone. Other villagers who followed in his footsteps also had their rooms sold out. The village's narrow roads were jammed with cars, a sign of the flourishing economy at Indonesia's edge.

According to Herlin, head of public services in Temajuk, about 80% of the village's 620 households now enjoy 24-hour electricity.

"The rest—those living deeper in the interior, still don't have access," she added.

The presence of stable electricity has undoubtedly spurred the growth of the local tourism sector, evident in the surging number of visitors.

"Since we got 24-hour electricity, the number of tourists has certainly increased. During Eid in 2023, we even hit 50,000 visitors, the roads were packed," Herlin recalled.

She also noted that local guesthouse operators are reaping the benefits of the tourism boom.

"Back then, people called Atong crazy. But look at him now, every holiday season, his income is impressive. His rooms are always full; he can easily make hundreds of millions of rupiah," she added.

Renewable Energy to Boost Tourism Potential

In 2022, Indonesia's Ministry of Tourism and Creative Economy officially designated Temajuk as a tourism village. Since then, the village's profile has risen significantly, including recognition in the Anugerah Desa Wisata Indonesia (ADWI), an annual program showcasing villages with strong tourism and cultural offerings.

"Temajuk stands out as one of the most promising tourist villages in West Kalimantan. Its border location, exotic beaches, and proactive community set it apart," said Windy Prihastari, Head of Youth, Sports, and Tourism for West Kalimantan.

Windy emphasized that reliable infrastructure, especially electricity and communication, is the key to village tourism development.

"Previously, power was only available at night and the network signal was nearly nonexistent. Now with a hybrid solar system, electricity runs 24/7, greatly improving visitor comfort and length of stay."

The impact is clear. Data from the provincial tourism office shows a sharp increase in tourist arrivals: from 2.4 million in 2021 to 4.7 million in 2024. Temajuk contributed significantly to this growth, especially during holidays, Eid, and year-end travel. Travelers are increasingly drawn to Temajuk's celebrated coastal charm and village ambiance.

Renewable Energy Potential

Temajuk boasts considerable renewable energy capacity, especially solar power. As early as 2011, the village also operated a micro-hydro power plant (PLTMH).

A study titled *Microgrid System toward Energy Self-Reliant Village Development in Temajuk* by Yunando and Sutriyatna describes this PLTMH powering around 25 nearby households through a low-voltage line extending approximately 2 km. It had an 18 kWp capacity and operated for about 12 hours daily.

Local water sources, including the Maludin River, Melake Bay, Pasir Pelaek, and Sekanji River, provide a steady annual flow, making them viable for year-round micro-hydro generation, per the study.

Meanwhile, solar power is ideal in Temajuk's equatorial location, with sun exposure from roughly 9 a.m to 4 p.m local time. The research found that combining PLTMH, solar, and diesel reduced monthly diesel fuel costs from IDR 69.2 million to IDR 29.8 million, a 57% saving.

One of the beach views in Temajuk Village, Sambas. (Photo by Maria/SUARAKALBAR.CO.ID).

"The average monthly operational cost of running the diesel power plant (PLTD) was Rp 69.2 million. After integrating the load patterns, fuel consumption dropped significantly, reducing the average monthly cost to Rp 29.8 million," the authors explained.

Another study, *Wind Energy Potential Analysis to Support Border Area Electricity: Case of Temajuk Village*, by M. Husni Tambrin, found that at a height of 20 meters, wind speeds reach 2.9 m/s in Temajuk, with a 20% capacity factor, indicating solid potential for wind turbines.

Despite these findings, the village currently operates on a hybrid system: 300-panel solar (371 kWp) with a 708 kWp battery, supplemented by a 310 kWp diesel plant (PLTD).

Rudy Hadianto from the provincial Industry, Trade, and ESDM office said the hybrid system has proven effective in electrifying a 3T (disadvantaged, frontier, outermost) village, taking service from 12 hours to a full 24 hours.

He also candidly noted that efficiency gains help PLN generate its own revenue, with the diesel plant playing an ongoing role. West Kalimantan's renewable energy target stands at 31.2% by 2025, above the national average. But, he admits, the challenges are significant.

Rows of solar panels from the Temajuk Village Solar Power Plant (PLTS) stand neatly aligned. (Photo by Maria/SUARAKALBAR.CO.ID).

"The target for West Kalimantan is to complete electrification in all villages by 2029, aiming for at least 99.9% coverage," Rudy said.

He also pointed out the challenges facing solar power plants, particularly the procurement of solar panels, despite West Kalimantan's strong potential for clean, renewable energy.

"We can produce silicon, but not the kind that absorbs sunlight. That's one reason why some investors hesitate when it comes to building solar power plants," Rudy explained.

Ahmad Syukri, Executive Director of Link-AR Borneo, confirmed that West Kalimantan indeed holds significant renewable energy potential, including solar. However, he expressed disappointment over what he sees as the government's inability to fully optimise the use of solar power (PLTS).

"In my view, we shouldn't have to wait for investors to maximize PLTS. Especially in remote regions, there should be enough funding to make PLTS fully operational without relying on diesel generators (PLTD). If the PLTS in

Temajuk ran on solar alone, it could boost tourism by branding the village as a clean energy destination. That's something we can promote and sell," Syukri said.

On the issue of high solar panel costs, Syukri believes Indonesia has the capacity to assemble its own panels, if the government steps in to support the effort.

"If we can't yet make heat-absorbing silicon for electricity, why not just buy the technology? It might be costly at first, but we could empower local communities to assemble panels themselves. Locally made products wouldn't be as expensive, and people could install them at home," he added.

As Indonesia pushes toward its "Golden Indonesia 2045"[31] goal through renewable energy transition, Syukri emphasized the importance of justice for local communities.

"The shift to renewables must also be fair. We shouldn't chase development at the expense of people losing their land or homes to make way for large-scale power plants or solar farms. That's not green energy, it just heats up tensions," he said.

He urged the government to take renewable energy seriously, not just as a branding tool on the international stage, but as a real effort to protect people's welfare.

"PLTS is a good solution because it reduces our dependency on centralized energy systems. In Europe, some areas recently experienced blackouts due to extreme weather, yet one place stayed lit thanks to private solar panels. That's a lesson Indonesia should take to heart. We can't afford a blackout of our own," he warned.

With multiple studies supporting Temajuk's renewable energy potential, including wind farms, Syukri said the possibilities are there. The question, he said, is one of political will.

"We have all the potential. The only question is, does the government really want it?" Syukri concluded.

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https://www.suarakalbar.co.id/2025/05/cahaya-24-jam-di-batas-negeri/

31 Golden Indonesia 2045 or Indonesia Emas 2045, is a national vision aiming to transform Indonesia into a sovereign, advanced, fair, and prosperous nation by its 100th year of independence

Caroline

West Kalimantan

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The Sun Over the Equator, a Deferred Dream for Clean Energy

by Caroline

The equator line runs directly through Pontianak City, blessing it with year-round sunshine. Yet, despite this abundant solar potential, the city ironically still depends on fossil fuels, contributing to environmental degradation. The journey toward clean energy in Pontianak has been anything but easy. Though rooftops across the city hold vast potential for solar energy, challenges remain persistent.

One of the early adopters of solar power in Pontianak is Ferdy Ardian (42), a musician who outfitted his music studio with a Solar Power Plant (PLTS) system. In 2011, amid frequent blackouts, Ferdy installed solar panels himself on the roof of his 48-square-metre studio. That same year, he also began offering solar panel installation services, a side job that ran alongside his music-making.

Solar panels were a rare and alluring sight during those blackout-prone times. Though costly, they sparked curiosity. People came to look, to ask questions, and some even decided to install their own. Today, that initial excitement has dimmed.

"Back then, each panel cost 3.5 million rupiah. I bought seven for a single house, but only used them during the day," Ferdy recalled. "The system was limited to powering lights, fans, and a water pump. For heavy equipment like air conditioners and studio gear, I still relied on PLN."

Ferdy's system is off-grid, completely independent from the PLN electricity network. It relies entirely on solar-charged batteries to supply electricity during the night.

In contrast, on-grid systems, which connect to the PLN network, are more ideal in urban settings. These systems draw solar energy during the day and switch to PLN electricity at night. A hybrid system operates similarly but includes batteries to store daytime energy for nighttime use.

"If it's on-grid, you use solar power in the day, PLN at night. It's a mix. Going fully solar is actually more expensive. Besides, in cities, PLN power is still available," Ferdy explained.

He sees solar power as particularly valuable in remote areas with no access to the electricity grid. In such places, fuel for generators, used for nighttime lighting, can be a costly necessity.

"For example, some families need four litres of petrol every night just to power a generator. That cost adds up. Solar is much more efficient in that case," he said.

In these off-grid areas, solar power systems typically serve as the primary energy source, supplemented by batteries for energy storage.

For households in Pontianak, Ferdy believes rooftop solar panels offer a real opportunity to save on electricity bills and reduce dependency on PLN. He speaks from experience: "It cuts my PLN usage in half." He also notes that rooftop PLTS is relatively safe, equipped with protective measures that help prevent electrical short circuits.

Equatorial Sun

Pontianak City, dubbed the "Equatorial City," enjoys a rare geographical privilege. With the equator cutting directly through it, this capital of West Kalimantan receives consistent sunlight year-round, an invaluable resource for solar energy development.

Research published by the *Journal of Electrical Engineering, Energy, and Information Technology (J3EIT)* from Tanjungpura University supports this potential, noting that Pontianak's average solar energy intensity reaches 146.98 W/m² annually. The study also found a strong correlation between solar radiation, ambient temperature, and the power output of solar panels.

Ahmad Syukri, Chairperson of the environmental organization LINK-AR Borneo, views solar energy as a tool for energy justice, if developed with the right approach. According to him, a just energy transition rests on two foundations: its orientation and its environmental integrity.

"Who is the energy really for? Is it meant for the community, or merely to serve industrial and commercial interests? Because electricity growth tends to prioritize industry over households," said Syukri, often called Uki.

He emphasized that not all renewable energy is clean by default. For instance, biomass has the potential to trigger deforestation, undermining the very goals of the energy transition.

"Losing forests accelerates global warming. That defeats the purpose of switching to renewable energy. Meanwhile, geothermal requires drilling that releases additional heat. So we must examine the environmental trade-offs," he noted.

Even with solar panels, Uki stressed, environmental considerations remain. The production of panels involves mineral extraction, and large-scale installations can generate heat. He cited complaints from Tanjungpura University students about rising temperatures near centralized solar installations.

"If we had to choose from all the renewable energy sources, none of them are truly perfect. There's no such thing as completely clean energy," he explained at length. "Even solar power, which uses panels, relies on materials that are mined. Secondly, to some extent, even though it may be indirect, these panels still generate heat, especially on a large, centralised scale like the installation at Tanjungpura University. I've heard students there complain about the heat produced by the panels, saying it feels hotter than usual. So solar power systems still require more advanced technology, particularly in terms of battery storage," he said.

At the government level, efforts to embrace solar energy are underway. The West Kalimantan Provincial Office of Industry, Trade, Energy and Mineral Resources has installed rooftop solar panels at its own facility as a pilot project. According to Rudi Hardiyanto, Head of Electricity and Energy Management, this initiative aims to inspire similar adoption by households, government buildings, and private companies.

While solar power cannot absorb carbon emissions the way trees do, Rudi explained that it plays a key role in reducing emissions by decreasing dependence on coal-fired and diesel-fueled power plants.

"Both PLTU and PLTD produce significant emissions for every kilowatt-hour of electricity they generate. This is where renewable sources like solar become crucial. The more we use them, the less we depend on dirty power," he said.

One 1 kilowatt-peak (kWp) rooftop solar system, he said, can reduce around 1.33 tonnes of CO_2 emissions annually. A household with a 25 kWp installation could therefore cut roughly 33.25 tonnes of CO_2 each year. Using data from the Aksara app, which tracks Indonesia's energy mix, Rudi converted that figure into the equivalent carbon absorption of about 1,511 mature trees, assuming each tree absorbs 22 kg of CO_2 per year.

Currently, rooftop solar panels in Pontianak are mainly used to improve energy efficiency and support a cleaner energy mix for government buildings and public lighting.

"This program has two goals," Rudi added. "First, to increase the renewable energy mix; and second, to drive efficiency and reduce spending."

Kalimantan's Energy Consumption Mix in 2024.[32] *Source: West Kalimantan Office of Industry, Trade, and Energy and Mineral Resources.*

32 Data shown reflects the total energy consumption in West Kalimantan for the year 2024, based on Barrel of Oil Equivalent (BOE) and Ton of Oil Equivalent (TOE) measurements for oil, coal, and renewable sources such as solar, hydro, and biomass. Natural gas recorded zero consumption in West Kalimantan in 2024, indicating no reported use of this energy type in the region during the year

He pointed to Java Island as a case study. Many industries there have installed rooftop solar systems, accepting the high upfront costs in exchange for long-term savings.

"They know the break-even point (BEP) hits in 10 years. After that, they benefit from clean energy for free. But to get there, we need strong communication and socialisation to educate stakeholders," he said.

Muklis Zarkasih, Communication and CSR Manager at PLN, echoed this sentiment, framing urban PLTS development as part of the government's green energy agenda.

"Through PLTS, we can reduce emissions and mitigate environmental impacts," he said.

Muklis added that Pontianak's equatorial location makes it uniquely suited for solar initiatives. He cited the success of a hybrid solar power plant in Temajuk, Sambas Regency, as evidence of West Kalimantan's untapped solar potential.

Challenges Ahead

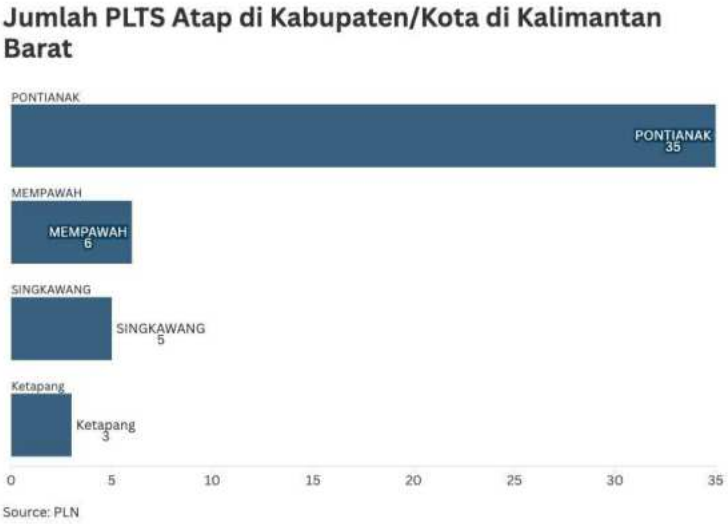
Nonetheless, the path to widespread adoption of rooftop solar power in Pontianak is far from smooth. A number of challenges continue to hinder urban communities from fully embracing solar energy, chief among them being the relatively high upfront installation cost. This is one of the main reasons why residential-scale rooftop solar power has yet to become a popular choice. As a result, spotting solar panels on rooftops remains a rare sight in the city.

According to data from the Indonesian Solar Energy Association (AESI), as of last year, the number of PLN rooftop solar power plant customers stood at just 3,472 nationwide, with a total installed capacity of 26.51 megawatt-peak (MWp). Meanwhile, PT PLN (Persero) data shows that Pontianak City is home to only 35 rooftop solar power plants.

"For Pontianak City, the number is still very small, and even those are mostly offices or companies," said Yudi Yanto, Manager of Generation at PT PLN (Persero) West Kalimantan Distribution Unit.

Currently, rooftop solar PV usage in Pontianak is largely concentrated in the commercial and industrial sectors. Businesses are increasingly turning to solar as part of their efforts to meet green energy requirements and maintain an environmentally responsible image.

"Most of the PLTS usage is in offices. It's because their business needs to meet the green energy requirements. So one way to do that is by using PLTS. For example, GAIA Mall," he said.



Distribution of Rooftop Solar Power Plants in West Kalimantan (2024). Source: PLN

From a technical standpoint, one of the obstacles in residential rooftop solar implementation is the need for special energy metering systems. On-grid rooftop solar systems require infrastructure that can support dual-source energy input, both from the solar panels and the PLN grid.

"We only have on-grid data because the on-grid connection draws from two sources: the PLTS itself and PLN. We collect data and adjust the metering accordingly. We can't use regular meters. It requires an export-import meter, known as AMI (Advanced Metering Infrastructure), which can read both energy export and import. It's essentially a smart meter. One installation with two sources that switches automatically," he explained.

The implementation of AMI meters requires additional investment and broader public outreach. Furthermore, integrating household-scale solar PV systems into the existing electricity grid demands careful planning and technical calibration to avoid disrupting overall supply stability.

From an economic perspective, the impact of rooftop solar for Pontianak households remains limited. While PLTS can help reduce electricity bills, the base tariff set by the government remains the main point of consideration.

"Under the new regulation, the price remains the same. It just reduces usage. For instance, a household with a 1400 Volt-ampere (VA) tariff

previously paying IDR 500,000 could see a reduction depending on how much solar power offsets PLN usage. PLN's per-kWh pricing for 1400 VA might rise slightly with percentage increases. And these are still regulated by the government through ESDM," Yudi added.

This means that electricity savings depend largely on how much energy the solar panels generate and how much PLN-supplied power is displaced. Weather is also a critical factor in determining the effectiveness of rooftop solar systems.

"The use of rooftop solar panels depends on the weather. If it's sunny, the batteries charge fully, and solar energy is maximized. But if it's cloudy and the solar input is low, then more energy comes from PLN. So the cost varies depending on usage and weather conditions," he explained.

Another major hurdle is the steep cost of installation. Ferdi, an independent installer, noted that the high upfront price of solar panels often deters interest. He shared a cost estimate based on minimal usage needs.

"If there's no refrigerator or air conditioning, the initial setup costs around IDR 20 million. On top of that, there are maintenance costs, although they're not too burdensome, maintenance is needed only once every 3–5 years. Mostly, it's just cleaning moss off the panels, as moss can block light absorption," he said.

There is also a significant lack of public knowledge about solar power. A more robust education effort is needed to raise awareness and interest.

"Some people ask about it. Most don't understand how solar panels work but want to install them anyway. So the educational process can be tricky," Ferdi said.

Based on his own experience, Ferdi argued that home-scale solar systems are not complicated. The basic setup only requires solar panels, inverters, and batteries.

"To install solar panels, you need to understand electronics. There aren't many spare parts, and the lighting used is special, DC (direct current) lights, not regular lamps. That's why education is essential," he added.

Ferdi taught himself through online resources and eventually became proficient in installing solar power systems. Over time, installation requests began to roll in, mostly from rural communities without access to electricity. However, demand has since declined as government electrification programmes have reached more remote areas.

Last year, he only handled three installations, not for individual homes, but for worker camps. These systems were primarily used to power lights at night and charge mobile phones.

"One of them was on Kabung Island, then in Tayan and in Ambawang. This year, there's another request in the Lake Sentarum area. One labour camp requires hundreds of millions of rupiah worth of solar panels. Installation fees and accommodation are covered by the customer," he explained.

Economic Reality

If Ferdi the musician can install solar panels himself and offer installation services, Ko Aci, a solar panel supplier, is no different. He sees the potential of solar energy to drive the economy and empower communities. Not only does he sell solar panels, but he also provides education and assistance to customers.

"If someone wants to install it themselves, we still educate them," he says, showing his enthusiasm for sharing knowledge.

But he sees how people's enthusiasm often clashes with economic realities. "If your electricity bill is small, there's no need to install solar panels, just use PLN," he says. This is because, behind the sheen of solar panels, lies a significant upfront investment.

The high cost of solar energy devices remains a major hurdle for people wanting to switch to clean energy. "We usually offer 4–5 million rupiah for one house," said Ko Aci, a figure that may feel burdensome for most families. This doesn't include the cost of replacing batteries, which can also be substantial.

Currently, Ko Aci no longer installs new solar panels. He now only sells spare parts or maintenance equipment for previously installed systems.

Agreeing with Ferdi, Ko Aci notes that public perception is another obstacle. Misunderstandings about maintenance costs, doubts over effectiveness during cloudy weather, and general unfamiliarity with PLTS technology all hinder adoption of solar energy in urban settings. Existing regulations can also feel like a confusing maze.

Energy regulation

On the regulatory front, Rudi Hardiyanto, Head of the Electricity and Energy Management Division at the Ministry of Energy and Mineral Resources, said

that there are no local regulations created by local governments specific to rooftop solar (PLTS). Current rules still refer to national laws or ministerial regulations issued by the Ministry of Energy and Mineral Resources (ESDM).

As for subsidies, he explained that the government's scheme for solar PV is not a direct tariff reduction. Instead, it's an on-grid subsidy mechanism that uses the kWh export-import (exim) system, a specialised meter for solar panel setups.

Unfortunately, instead of offering significant financial benefit, this system primarily acts as a way to reduce electricity import bills from PLN. It's a mechanism known as net metering.

"So, kWh exim, export-import, the import is the supply from PLN that we still have to pay for. The subsidy reduces the import. So the larger the kWh, the bigger the reduction. It's not a price discount," Rudi clarified, explaining how household-scale rooftop solar users benefit from the system.

Rudi further noted that government incentives for PLTS are more focused on tax and customs relief for imported solar components.

"For instance, there are imported goods, since the components must be bought from abroad. There's indeed an incentive tariff because it's related to new and renewable energy. But that's a matter of customs and tax. That's why I said subsidies and incentives are handled by the ministry," he explained.

He also confirmed that there is currently no direct subsidy for buying solar panels. Instead, the government is focusing on encouraging local governments and private sectors to adopt rooftop solar solutions.

"There's no panel subsidy. It's more of an appeal, though one that the government really hopes will be implemented," he said.

He went on to stress the importance of the Regional Energy General Plan (RUED), compiled by ESDM and later formalised as a regional regulation at the provincial level. This becomes a crucial reference for investors looking to enter the renewable energy sector, including solar.

"RUED is indeed compiled by ESDM, but once enacted as a regional regulation, it becomes the property and authority of the province. All investors refer to it because it's a mandate from the Energy Law. Once compiled, it must be regionalised so that local governments can increase the energy mix, one of which is PLTS," he added.

Although the central government has issued Ministerial Regulation No. 26/2021, updated by Ministerial Regulation No. 2/2024, concerning Rooftop

Solar PV Systems Connected to the Power Grid of Public Electricity Supply Business License Holders, implementation is not without hurdles. The regulation is intended to simplify and accelerate the adoption of rooftop solar power systems.

The rule covers ease of installation and grid connection, net metering mechanisms and compensation for excess energy, capacity limits, technical and safety standards, roles and responsibilities of stakeholders, future incentives, licensing simplification, and public use of rooftop solar systems.

Meanwhile, PT PLN (Persero) promotes the "One Million Roofs" programme. However, the focus is not on installing rooftop solar systems in urban homes like those in Pontianak. Rather than being a massive urban solution for energy independence, the initiative targets remote areas that are difficult for PLN's conventional grid to reach.

According to Yudi Yanto, Generation Manager of PT PLN West Kalimantan Distribution Unit, the programme enables customers with limited power, say 1300 VA, to split their supply, using a portion from solar panels (e.g., 1000 VA) and the rest from PLN (300 VA), with a mutually agreed payment scheme.

However, this programme is not implemented everywhere.

"But we only apply it in areas far from PLN. The One Million Roofs programme is focused more on those, targeting islands that are not electrified," he explained.

This clarifies that the programme is more about addressing electrification gaps in remote areas than it is about supporting the urban energy transition.

So what about the potential for rooftop solar power in urban areas, especially in Pontianak?

Yudi admits that the planning for PLTS implementation already exists. "We've prepared the PLTS plans, but the challenges lie in regulations, infrastructure, and investors," he said.

This aligns with the earlier challenges outlined in the implementation of rooftop solar PV in urban settings: lack of supportive regulations, inadequate metering infrastructure, and limited targeted investment. These remain the main hurdles preventing widespread adoption of rooftop solar energy at the household level in cities like Pontianak.

Map of Renewable Energy Potential in West Kalimantan.[33]*Source: PLN*

Energy Independence

Inside a 3x4 metre office at the Master of Engineering Building of Tanjungpura University, academic Ismail Yusuf, who has conducted studies and research on solar power plants, offers a bleak assessment. He slowly shakes his head when asked about the prospects of an energy transition using solar power in Pontianak. "The potential is there because our sunlight is abundant. But if the goal is to replace existing sources, economically it doesn't make sense. Even using an on-grid system, it's not feasible," he says quietly.

For Ismail, rooftop solar PV investment in urban areas like Pontianak still feels like an illusion, raising more questions than solutions. From the high cost of installation, lower efficiency compared to PLN electricity, to the carbon footprint of solar panel production, the obstacles are evident.

"As long as there's access to the PLN grid, the effectiveness of solar

33 This map highlights the renewable energy potential across West Kalimantan, covering mini-hydro (PLTM), biogas (PLTBg), biomass (PLTBm), and solar power (PLTS) facilities. With projects ranging from 1.2 MW to 17 MW, the province showcases diverse resource availability. Most initiatives are spread across inland and coastal areas, with key development clusters around Sambas, Sekadau, and Ketapang. Some facilities are under construction, while others are scheduled for development between 2023 and 2025. This data reflects PLN's ongoing efforts to diversify the energy mix and expand sustainable electricity access throughout the region.

panels is minimal. Is it efficient? No, it isn't. Is it more efficient overall? Still no. If people found it truly useful, they would've adopted it on their own. As an experiment, sure. But on a large scale? Not yet," he said.

He believes solar energy is more suitable for remote islands untouched by conventional electricity networks. The dream of rooftop solar power replacing current energy sources in urban areas remains distant, stymied by economic reality. Even the net metering program, once hailed as a breakthrough, now feels like a forgotten memory.

Net metering allowed renewable energy users, such as solar panel owners, to earn credits for excess power fed into the PLN grid.

Ko Aci, though equally pessimistic about current solar panel sales, still sees hope, if the government steps in.

"It all depends on the government," he says. According to him, if there's political will to build city-scale centralized solar power plants, the dream could become reality. However, the sheer investment already poured into existing PLN infrastructure remains a major barrier. The dominance of PLN's network is hard to match, let alone replace.

"If the government wants to build a centralized solar system for all of Pontianak, it's possible," he says optimistically.

He still sees long-term opportunities. In the early years of his solar panel business, demand was strong.

"In 2018, installations surged until 2020, though mostly outside the city. We charged around 400,000 to 500,000 rupiah per installation. But operational costs to reach those areas were high," he shared.

According to him, convoluted regulations, like the requirement to obtain an Operation Certificate (SLO) to install a home solar system, should be reviewed. He also believes the reinstatement of net metering incentives could help accelerate adoption.

In the same spirit, Ahmad Syukri, Chairman of LINK-AR Borneo, believes several steps could help speed up the energy transition to solar. First, mass production of solar panels by the government.

"If the government mass-produces panels for the public, the price will drop significantly. Add to that a trained technician network available everywhere. But sadly, our electricity policy isn't geared toward public interest, it's commercial. If the government pushes for energy independence, PLN loses out," he quips.

He also criticizes the government's apparent focus on chasing international funding for energy transition, instead of offering real support to help citizens switch to solar. The energy transition, he argues, should be driven by a true commitment to clean energy and reducing fossil fuel dependence.

"The government needs to make it easy, just like the kerosene-to-LPG[34] transition," he says hopefully.

From the electricity provider's perspective, Muklis Zarkasih, Manager of Communication and Environmental Social Responsibility at PLN, doesn't deny solar power's potential as an innovative solution to reduce emissions. Yet he also outlines real challenges: the relatively high cost, continuity and voltage stability concerns, and technical calculations involving roof area and load capacity.

Add to that the risks posed by extreme weather, such as tornadoes, and high maintenance costs. While he never outright says it's impossible, Muklis's tone carries a cautious realism.

Even so, he doesn't give up hope. To him, rooftop solar is part of the innovation landscape.

"If we improve the regulations and infrastructure, solar power can be a viable solution. We also need to attract investors," he said, leaving the door open.

Ismi, a staff member in PLN's generation department, added that the 2021–2030 Electricity Supply Business Plan (RUPTL) has included renewable energy, including rooftop solar, as part of Indonesia's roadmap to net zero emissions by 2060. This, at least, signals growing attention to clean energy in long-term planning.

Amid all this, hopeful voices from women are emerging like a breath of fresh air.

Suci Lukitowati, known as Luki, a housewife in Pontianak, expresses her clear support for rooftop solar.

"It's great, because it's an inexhaustible energy source," she says with enthusiasm. For her, solar energy is not just about sustainability, but also economic resilience.

To Luki, rooftop solar isn't just a technology, it's a movement for a cleaner future.

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34 Liquefied Petroleum Gas

"If the installation were subsidized by the government, I'm sure many people would want to adopt it," she says brightly.

Still, she criticizes the bureaucratic red tape involved.

"Why should we need a permit first? Why not simplify it? If you want the people to be energy independent, stop making it difficult," she says firmly.

Echoing her view, Lulu Musyarofah, Chairwoman of the SAKA Foundation, emphasizes that from a woman's perspective, rooftop solar is far more eco-friendly than mining-based energy.

"When it comes to environmental impact, women are most affected. So we fully support rooftop solar energy," she asserts.

To them, solar energy offers hope for a sustainable future where environmental degradation doesn't become a burden for future generations. Amid ongoing debates about efficiency and technical barriers, they see solar not just as an alternative—but as a symbol of independence, justice, and sustainability.

Their expectations are clear: simpler regulations, compelling incentives, and subsidies to ease community adoption. Equally important is widespread education and awareness-building about clean energy.

Lulu adds that collaboration among stakeholders is key: The government must shape policies favoring clean energy, offer fiscal incentives, and simplify licensing. PLN should serve as a facilitator and infrastructure provider. Industry players can develop cost-effective installation and maintenance technologies. Academia can research and refine solar technologies. And most crucially, the public must be informed and empowered to embrace solar as part of a sustainable lifestyle.

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https://iniborneo.com/2025/05/02/mentari-khatulistiwa-mimpi-energi-yang-tertunda-bagian-1/

https://iniborneo.com/2025/05/04/mentari-khatulistiwa-mimpi-energi-bersih-yang-tertunda-bagian-2/

Muhammad Rokib

West Kalimantan

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Since 2023, he has been with RRI Pontianak, covering news, features, and social-political issues, while also producing audio-visual content for radio and online media.

Urban Gardens in Bloom: Sustainable Farming in Pontianak's Heart

by Muhammad Rokib

Residents harvest vegetables on organically fertilized, no-burn peatland in Kampung Gambut Siantan Hilir (Kuat Sihir), Darma Putra, North Pontianak District, West Kalimantan. (Photo by RRI/ Muhammad Rokib)

A group of villagers arrived just as Irwan and other members of the farmer group were packing the morning's harvest that Sunday. Their presence instantly brightened the mood at the lush garden filled with rows of spinach, mustard greens, water spinach, chilies, and various other vegetables.

The garden, initially quiet, came alive with laughter and chatter. The visitors were delighted and amazed by the thriving green vegetable plots at the Kuat Sihir Community Hall, short for Kampung Gambut Siantan Hilir, in Darma Putra, Siantan Hilir Village, North Pontianak District.

After a tour through the green expanse, Irwan welcomed his guests with servings of green vegetable noodles, homemade by the farmer group. "When we have a surplus, instead of letting it go to waste, we process it into noodles and other products," said Ida, Irwan's wife, while preparing noodles in the Kita Bersama Kitchen next to the community hall.

SMEs produce vegetable noodles in Kampung Gambut Siantan Hilir (Kuat Sihir), North Pontianak District, Pontianak City, West Kalimantan. (Photo by RRI/Muhammad Rokib)

Alongside the vegetable noodles, guests were also treated to an array of locally made snacks: vegetable sticks, cassava cracker, pineapple sticks, pineapple syrup, and dried roti canai. "We make use of everything we harvest," Ida explained.

Not a single crop is wasted. Every vegetable is turned into something useful, earning even more praise from the guests. "I really admire what they've done. Before I was finished marveling at the garden, they were already serving us all these homemade products," said Ade Marheni Dewi, one of the visitors.

But this was no mere picnic. The women had come to learn, not just to look. Their goal was to become productive and successful like Irwan's group, which manages a 10-hectare garden with care and ingenuity.

A group of Women listen to Irwan, a farmer and Chairman of BUM RW 33, at the Kuat Sihir Community Hall in Siantan Hilir, North Pontianak, West Kalimantan. (Photo by RRI/Muhammad Rokib)

During the visit, Irwan shared practical knowledge, starting from farming basics to product management. It wasn't all theory; he brought the residents into the field to observe the real thing. They saw everything from freshly planted beds to thriving vegetables ready to harvest.

"We even get to pick vegetables while learning how to farm," said Dewi, harvesting a bundle of mustard greens.

Residents harvest vegetables on community farmland in Kampung Gambut Siantan Hilir (Kuat Sihir), North Pontianak District, Pontianak City, West Kalimantan. (Photo by RRI/Muhammad Rokib)

Located just a short distance from the city center, the garden is set to be developed as a horticultural tourism site, complete with visitor facilities. With guidance from BUMRW 33[35] in Siantan Hilir Village, the project is already underway. But Irwan is still waiting on a much-needed capital injection to make the vision a reality. The investment required remains significant.

Shifting towards eco-friendly farming

Irwan began farming in 2015, initially practicing slash-and-burn agriculture. At the time, he and other farmers actively campaigned for forest and land burning, believing it allowed for collective farming. "Back then, not even the smallest branches were spared," Irwan recalled.

However, this method proved environmentally damaging. Burned areas became unusable, leaving vast tracts of land unproductive. "After we burned it,

35 BUM RW stands for Badan Usaha Milik Rukun Warga or Neighborhood-Owned Enterprise. It is a community-based economic unit established at the RW (Rukun Warga) level in Indonesia.

a lot of land ended up abandoned and unusable," he said. The consequences were severe, deforestation led to flooding during the rainy season, damaging agricultural land and infrastructure. Many farmers suffered crop failures.

In response, Irwan and his farming group, BUMRW 33, began transitioning to eco-friendly farming in 2019. They adopted peatland farming without burning and started utilizing crop residues as fertilizer. Their group manages about 30% of a 178-hectare peatland area and has become a model for sustainable farming in West Kalimantan.

A Group of women visit a community farm promoting eco-friendly practices in Kampung Gambut Siantan Hilir (Kuat Sihir), North Pontianak, West Kalimantan. (Photo by RRI/Muhammad Rokib)

"One harvest can yield 8 to even 12 tonnes of vegetables," Irwan noted. His daily harvests supply Pontianak City and even reach markets across West Kalimantan and beyond.

Irwan's approach aligns with Indonesia's Law No. 22/2019 on Sustainable Agricultural Cultivation and Law No. 41/2009 on the Protection of Sustainable Food Agricultural Land. He says these methods have produced positive results, not just for his group, but for other farmers now following suit.

Since 2019, Irwan has also reduced chemical inputs in farming. What began as 100% dependence on chemical fertilizers is now down to 30%, with 70% replaced by organic alternatives. The shift was partly due to limited access to subsidized fertilizer in 2018 and the long-term soil damage from chemical overuse, including a 40cm drop in soil surface.

Organic practices also reduced costs. Now, the group uses just one tank of chemical input for the entire field, replacing the rest with homemade liquid fertilizer made from lemongrass, betel, papaya leaves, and manure. A typical litre contains 20 kg of decomposed organic waste, distributed to group members for daily use.

Irwan explained that each litre of liquid organic fertilizer contains a mix of 20 kg of various organic wastes, such as vegetable scraps, banana trunks, and cow or chicken manure—fermented for several days. The resulting solution is then distributed among the group's farmers for use.

Farmers in Parit Paeran, Arang Limbung Village, Sungai Raya Sub-district, Kubu Raya Regency, West Kalimantan, are also cutting back on chemical use and embracing environmentally friendly practices. Aryo Trisno Subur, head of the local farmer group, said chemical fertilisers have proven harmful to their land.

Aryo regularly monitors soil acidity levels when using chemical fertilisers. Over time, he observed a drop from a neutral pH of 6–7 to an acidic 3–4, indicating soil degradation. He also noted that the land has become increasingly arid, with visibly declining quality. "If you use a lot of chemicals, the soil becomes unproductive," he said.

He believes that switching to eco-friendly inputs allows the land to support diverse crops again. "Unlike chemically treated land, organic land can be replanted with different varieties," Aryo explained.

Aryo checks soil pH in newly planted ginger beds on peatland in Limbung Village, Kubu Raya, West Kalimantan. (Photo by RRI/Muhammad Rokib)

Aryo became increasingly committed to switching from chemical to organic farming after realising that plant life spans could be extended, leading to more frequent harvests. Since 2024, he has gone fully organic. “The difference is, with chemicals, cucumber plants typically yield 14 harvests. With organic methods, we can get more than 19," said Aryo, who has received support from the Peat Restoration Agency.

Previously, Aryo and his farming group managed 1.2 hectares of peatland, growing vegetables like gambas, cucumbers, long beans, water spinach, and chillies. From a single growing season, they earned between IDR 7 to 11 million until 2023.

Over the past nine months, Aryo shifted focus to cultivating ginger and papaya on about one hectare of land, attracted by their low maintenance needs. The ginger, in particular, shows promising results. A trial harvest from just half a bed (approximately five metres long) yielded 49 kilograms, selling at IDR 15,000 per kilogram. Aryo has already planted over 50 ginger beds, each about 10 metres long, and plans to expand the crop across the entire hectare.

“I'm still adding more ginger, because the land area is about one hectare," he said.

Aryo showcases organic ginger farming on peatland without burning in Limbung Village, Kubu Raya, West Kalimantan. (Photo by RRI/Muhammad Rokib)

Other farmers are also starting to realise the harm caused by excessive chemical use. “Chemical fertilisers are expensive. Sure, the vegetables grow fast and look flawless—no caterpillars, smooth leaves. But if you think about it, we're feeding people poison because the residue stays," said Fendi.

Minimising Greenhouse Gas Emissions

Panca Bhakti University Pontianak lecturer, Ida Ayu Suci during an interview. (Photo by RRI/Muhammad Rokib)

Ida Ayu Suci, an agrotechnology lecturer at Panca Bhakti University Pontianak, explained that prolonged use of synthetic chemicals depletes soil nutrients, increases toxicity, emits greenhouse gases, and poses health risks to farmers.

"The more it's used, the greater the carbon emissions. Practices like land burning also contribute significantly to greenhouse gases, which heavily impact the environment and intensify the greenhouse effect," she said.

The number of truly organic farms in West Kalimantan remains limited. According to the West Kalimantan Provincial Government, only one farm has met organic certification standards, pineapple cultivation in Galang Village, Sungai Pinyuh Subdistrict, Mempawah. Covering 15 hectares, the farm is managed by the Harapan Baru Farmer Group.

The group has secured an Organic Pineapple Certificate from the Seloliman Organic Certification Institute in Mojokerto, East Java, as well as recognition from the provincial government, including a Prima 3 Product Certificate.

Head of the Horticulture Division of the West Kalimantan Food Crops and Horticulture Agency, Bader Sasmara during an interview. (Photo by RRI/Muhammad Rokib).

Yields from the organic pineapple farm reach 1–2 tonnes per hectare. Beyond fresh fruit, the farmers process the pineapples into sweets, jams, syrups, dodol [36], shredded pineapple, crackers, and kelulut honey (stingless bee honey). Their success earned the Galangsari Farmer Group the Sida Karya award from the West Kalimantan Provincial Labour and Transmigration Office.

36 Traditional Indonesian sweet, toffee-like texture.

While most farmers in West Kalimantan still rely on semi-organic materials, open burning is becoming a thing of the past. According to Bader Sasmara, Head of the Horticulture Division at the West Kalimantan Food Crops and Horticulture Agency, most agricultural land is no longer cleared using fire.

In 2024, the province recorded a total horticultural output of 613,604 tonnes from 39,330 hectares of harvested land. This includes 542,463 tonnes of fruit, 58,927 tonnes of vegetables, and 21,500 tonnes of biopharmaceutical crops.

However, the figure represents a 3.51% decline from 2023. “Weather may be a contributing factor," Bader explained. “Another challenge is the difficulty in gathering field data. The vast distances between villages and limited compensation for field officers may result in incomplete reporting."

Pontianak City remains a key horticultural hub in West Kalimantan. According to Muchammad Yamin, Acting Head of the City's Food, Agriculture, and Fisheries Office, vegetable production in North Pontianak alone can reach 15–30 tonnes per day, supplying regions as far as East Kalimantan.

To meet growing demand, the city government is ramping up support through national programs, such as corn cultivation, and improving agricultural infrastructure. Despite increasing urban development reducing farmland, efforts are underway to expand agricultural areas and sustain production

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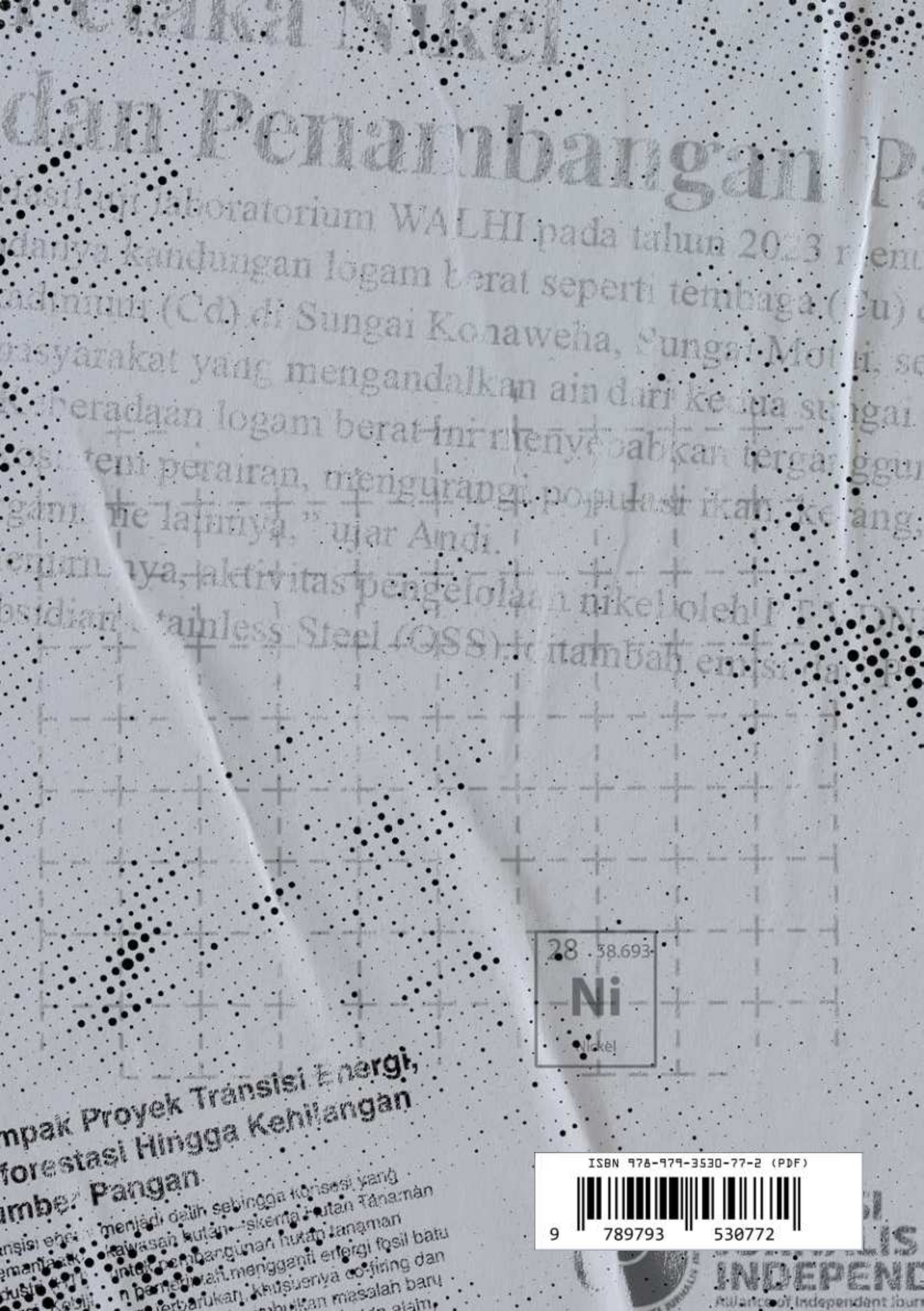

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