Towards Minamata COP-6: The State of Small-scale Gold Mining (ASGM) in Indonesia

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Executive Summary

Indonesia is one of the world's largest hubs for artisanal and small-scale gold mining (ASGM), with operations spread across more than 1,200 locations in 190 cities/regencies across 31 out of 34 provinces, including 15 protected areas. Despite ratifying the Minamata Convention in 2017 through Law No. 11/2017, mercury use remains rampant in ASGM, contributing to 69.7% of Indonesia's total mercury emissions, with an estimated release of 307,125 kg per year.

The decentralization of governance in the early 2000s and rising gold prices have led to a surge in unregulated ASGM activities. Although Indonesia officially banned mercury imports in 2015 following restrictions from the EU and the US, the country has since emerged as a major mercury producer and exporter, shipping 635 tons to 13 countries in 2017 alone. In 2019, Presidential Regulation No. 21 introduced the National Action Plan for Mercury Reduction and Elimination (RAN-PPM), which bans the use of mercury in the ASGM sector and sets a target to phase out mercury use in ASGM by 2025. However, illegal mercury circulation remains widespread.

Mercury exposure in ASGM communities poses severe health risks. Mercury vapor from gold processing exceeds WHO safety limits, leading to chronic metallic mercury vapor intoxication in 18-23% of miners. Studies show that Indonesian women have an average total mercury concentration of 9.4 mg/L in their bodies. Mercury bioaccumulates in the food chain, particularly in fish, leading to neurological damage, developmental disorders in children, and long-term environmental contamination. Cases of mercury poisoning have been reported, including birth defects and high rates of respiratory illness in affected areas.

Biodiversity is also at risk. Studies on marine and terrestrial wildlife indicate significant mercury contamination, particularly in fish and birds, affecting ecosystem health and food safety. Mercury pollution from ASGM affects major rivers like the Kapuas in West Kalimantan and coastal ecosystems in Maluku, threatening marine biodiversity and human livelihoods.

Despite legal restrictions, Indonesia remains a hotspot for illicit mercury trade, with significant illegal exports and imports. Minister of Trade Regulation No. 75/M-DAG/PER/10/2014 strictly prohibits the import, trade, and use of mercury in the mining sector, its implementation remains ineffective. Between 2015-2017, Indonesia exported approximately 1,116 tons of mercury, valued at USD 8,5 million, most of which were undocumented in national trade statistics. Illegal

mercury distribution networks often involve influential actors, complicating enforcement efforts. During 2017-2023 period, a total of 44,724.41 kg of mercury and 8753.41 of cinnabar were confiscated by the Indonesian authorities, but the actual figures should be more than that since illegal mercury and cinnabar trade still persists locally., Only 11 provinces and 10 cities/regencies have adopted Local Action Plans (RAD-PPM) to combat mercury use, leaving many areas without formal strategies.

Nexus3 Foundation is actively researching mercury remediation methods, including biochar adsorption and phytoremediation using vetiver grass, which shows promise for stabilizing mercury in contaminated soils. In parallel, partnerships with local universities and industries are advancing the development of methylmercury detection tools to improve environmental monitoring and risk assessment. In collaboration with the Attorney General's Office and the Center for Regulation, Policy, and Governance (CRPG), Nexus3 is also contributing to developing guidelines for safe handling and temporarily storing mercury evidence. While Indonesia's National Action Plan on Mercury (RAN-PPM) outlines plans for feasibility studies and establishing interim and final mercury storage facilities, these measures have yet to be implemented, and the country currently lacks such infrastructure.

To effectively eliminate mercury use in ASGM and fulfill Indonesia's commitment to the Minamata Convention, the government must strengthen law enforcement by cracking down on illegal mercury trade and ensuring strict enforcement of import and export bans. Amending the Minamata Convention to end global Hg trade and establish a global deadline for phasing out mercury in ASGM by 2032 is crucial, as the sector currently lacks a mandatory phase-out target. Expanding access to mercury-free gold extraction technologies and providing financial and technical support will accelerate the transition to safer alternatives. Secure storage and disposal facilities for seized mercury must also be established to prevent re-entry into illicit markets. International collaboration and funding through mechanisms like GEF and GCF can support these efforts. At the same time, the swift implementation of National and Regional Action Plans (RAN-PPM and RAD-PPM) will ensure Indonesia meets its goal of becoming mercury-free by 2030.

Figure 1. Map of ASGM distribution in Indonesia (source: Nexus3)

Background

Indonesia is one of the countries with the largest distribution of Small-scale Gold Mining (ASGM) in the world. Despite having ratified the Minamata Convention in 2017 through Law No. 11/2017, it is recorded that ASGM practices are spread in more than 1,200 locations in 190 cities/districts in 31 out of 34 Indonesian provinces and in 15 national park/nature reserve/conservation area locations in 2019 (Ismawati et al., 2019). The report also states that around 69.7% of total mercury emissions in Indonesia come from the ASGM sector, with an estimated release of 307,125 kg Hg/year. This shows that although regulations prohibit the use of mercury, it is still widely used illegally, especially in the ASGM sector.

With the rise in gold prices and decentralization of government in the early 2000s, unlicensed ASGM activities became more widespread. Until 2014, Indonesia was still importing mercury from various countries. However, since the European Union and the United States banned mercury exports in 2015, Indonesia has become one of the world's largest mercury producers and exporters, reaching 635 tons in 13 countries (UNEP, 2017).

In March 2017, President Joko Widodo issued seven presidential instructions through Presidential Regulation No. 21/2019 on the National Action Plan for Mercury Reduction and Elimination (RAN-PPM), one of which bans the use of mercury in the ASGM sector. The Presidential Regulation targets eliminating mercury use in the ASGM sector by 2025. However, its circulation is currently still rampant illegally in various provinces in Indonesia.

The impact of mercury exposure on the health of communities around ASGM areas continues to be a serious concern. Mercury releases from ASGM contaminate land and water, increasing health risks for miners and surrounding communities. Miners and communities living around gold processing centers, kilns, and gold shops are exposed to dangerous levels of mercury vapor, exceeding the safe limits set by the WHO. Studies show that 18-23% of miners experience *Chronic Metallic Mercury Vapor Intoxication* (Steckling et al., 2017). Research in 25 countries found that Indonesian women had an average mercury concentration of 9.4 mg/l (Bell et al., 2017). In addition, mercury impacts the development of children and can cause permanent neurological disorders. Mercury can accumulate in the food chain, especially through fish consumed by local communities and the environment, impacting public health.

As outlined in Indonesia's commitments in the 2018 Bali Declaration, improving mercury trade monitoring is a priority. One of the main obstacles is the growing illegal trade in mercury, especially from cinnabar mines. Since 2015, Indonesia began illegally exporting mercury in large quantities. Based on UN Comtrade data, in 2015-2017 Indonesia exported around 1,116 tons of mercury with a transaction value of USD 8.5 million. These exports were mostly done unofficially, without being recorded in national trade statistics. Although Minister of Trade Regulation No. 75/M-DAG/PER/10/2014 strictly prohibits the import, trade, and use of mercury in the mining sector, its implementation remains ineffective. Several cases show that actors involved in the illegal trade of mercury have ties with the authorities, which hinders mercury eradication efforts in the ASGM sector.

Ahead of the Minamata Convention or COP-6 in November 2025, Indonesia must provide a progress report on implementing the mercury elimination policy, especially evaluating the National Action Plan (NAP) in the ASGM sector to show commitment and concrete steps in addressing mercury issues.

National Policy Framework on Mercury and ASGM

The Indonesian government has ratified the Minamata Convention on Mercury through Law No. 11 of 2017. To implement the convention, Presidential Regulation No. 21 of 2019 on the National Action Plan for Mercury Reduction and Elimination (RAN PPM), and Minister of Environment and Forestry Regulation No. 81/2019 on the Implementation of Presidential Regulation No. 21 of 2019 on the National Action Plan for Mercury Reduction and Elimination were established.

The elimination of mercury use in small-scale artisanal gold mining (ASGM) is one of the priority sectors based on Annex I of Presidential Regulation No. 21 of 2019 and Annex II of Minister of Environment and Forestry Regulation No. 81/2019. These regulations provide implementation guidelines for RAN PPM, including strategies, activities, and targets for mercury reduction and elimination prioritized in manufacturing, energy, ASGM, and health.

Minister of Trade Regulation No. 75/M-DAG/PER/10/2014 explicitly prohibits the importation, trade, and use of mercury in the mining sector, including artisanal and small-scale gold mining (ASGM). This regulation, which amends earlier hazardous materials control laws, was introduced to curb mercury use in mining activities due to its severe environmental and health impacts. Despite this legal prohibition, enforcement has been challenging, and mercury continues to be used in ASGM operations across Indonesia.

Local Regulations on Mercury Reduction and Elimination

As a follow-up to the RAN PPM, local governments must develop and stipulate a Regional Action Plan (RAD) for Mercury Reduction and Elimination. As of July 16, 2024, the Ministry of Environment and Forestry (MoEF) noted that only 11 provinces and 10 districts/cities have developed and ratified the Regional Action Plan for Mercury Reduction and Elimination (RAD-PPM).

List of Provinces with RAD-PPM:

1. West Nusa Tenggara Province
2. DKI Jakarta Province
3. West Java Province
4. Central Java Province
5. East Java Province
6. West Kalimantan Province
7. South Kalimantan Province
8. East Kalimantan Province

9. South Sulawesi Province
10. North Sulawesi Province
11. South Sumatra Province

List of districts/cities that have RAD-PPM:

1. Banyuwangi Regency
2. Bogor Regency
3. Cianjur Regency
4. Garut district
5. Lebak Regency
6. West Lombok Regency
7. Central Lombok Regency
8. East Lombok Regency
9. Bogor City
10. Mataram City

Some examples of regional regulations that have been established include:

- South Kalimantan Governor Regulation Number 53 Year 2022
- Banyumas Regent Regulation Number 16 Year 2024
- Central Sulawesi Governor Regulation Number 8 Year 202
- West Nusa Tenggara Province: Has enacted Governor Regulation Number 64 of 2020 on RAD-PPM, which includes strategies and action plans for 2020-2025.
- DKI Jakarta Province: In 2024, DKI Jakarta issued Governor Regulation No. 27 Year 2024 on RAD-PPM for 2024-2030, focusing on reducing mercury use in the health and industrial sectors.

The RAD-PPM by provinces and districts/cities is a strategic step in reducing and eliminating mercury in Indonesia. However, many regions still do not have RAD-PPM, so it is necessary to accelerate the preparation and implementation of these documents to achieve the national target of a mercury-free Indonesia by 2030.


(a)


(b)

Figure 2. Drum processes gold using mercury (a) and equipment to burn amalgam to separate gold and mercury (b). (source: Nexus3)

Small Scale Gold Mining Activities in Indonesia

ASGM activities in Indonesia have been going on for centuries, especially in areas rich in mineral resources. The sector experienced significant growth since the 1980s alongside the rise in global gold prices and easier access to simple mining equipment. However, most ASGM activities are still conducted informally and using traditional methods, especially with the use of mercury, which has negative impacts on the environment and public health.

North Sumatra - ASGM in North Sumatra began in 2005 through gold rock exploration in the Hutabargot Mountain area. It is spread in several regions such as Mandailing Natal, South Tapanuli, Deli Serdang, Dairi, Humbang Hasundutan, Langkat, and Padang Lawas. It is generally conducted informally in remote areas, even within protected forests and conservation areas. ASGM contributes to significant mercury emissions, reaching 13.5 tons annually in North Sumatra (BCRC, 2019). Data shows that in Mandailing Natal, approximately 192 tons of mercury are used annually, with most of it as waste or emissions (Agrawal & Susilorini, 2020). Cases of mercury poisoning have been reported, including birth defects and high rates of respiratory illness in affected areas.

Central Sulawesi - Central Sulawesi Province, is estimated to contribute around 2.32% of the total gold reserves in Indonesia. The areas of Parigi Moutong, Toli-Toli, Donggala, Palu, Sigi and Lambunu are known to have gold deposits. The largest gold mine in Central Sulawesi is PT Citra Palu Mineral. ASGM activities are found in 7 regencies/cities in Central Sulawesi. The number of ASGM with IPR (People's Mining License) in Central Sulawesi is 5 IPRs, located in Parigi Moutong (2 IPRs), Buol (2 IPRs), Palu (1 IPR). Since 2010, studies on mercury content in the environment and human body matrix around ASGM sites in Central Sulawesi have been researched and published. The study results can serve as baseline data on mercury pollution and efforts to reduce mercury contamination in various locations in Central Sulawesi. The results showed that the average mercury concentration in the studied areas exceeded the safe standard limit (Academic paper of RAD Central Sulawesi, 2023).

West Java - ASGM in West Java is mostly found in Mount Pongkor, Tasikmalaya, and Sukabumi. Gold processors from West Java are known to have the best skills and are often found in other ASGM areas in Indonesia. Although the Governor's Regulation on the Regional Action Plan for Mercury Reduction and Elimination in West Java was established in 2020, mercury in the ASGM sector is still massively used. Mercury is easily found and sold in small kiosks (*warung*) in their villages. Not only that, Sukabumi is known as a domestic mercury production site. The raw material for production is cinnabar stone mined from Copper Mountain, West Seram Regency, Maluku (KOMPAS).

Maluku - ASGM on Buru Island and cinnabar mining on Seram Island, Maluku are major mining sites in Indonesia. On Buru Island, since the discovery of gold at Gunung Botak in 2011, the use of mercury in the drum method has caused heavy contamination in Wamsait River and Kayeli Bay, with mercury levels in sediments reaching more than 7.66 mg/kg (Male et al., 2013). Mercury accumulation was also found in marine biota such as mud crabs and fish, posing a threat to food safety and public health. Meanwhile, cinnabar mining in Seram started in 2010 and is Indonesia's main source of domestic mercury supply for ASGM. Mercury concentrations in marine sediments around the mine reached 2796 mg/kg, with the affected area extending more than 14 km from the mine site (Male et al., 2024). Although mercury imports have decreased since 2016, local production from cinnabar mines in Seram appears to be the source of supply for the Indonesian region.

West Kalimantan - ASGM in West Kalimantan is found in Sintang, Kapuas Hulu, Landak, Bengkayang, and Mempawah. Rivers in West Kalimantan are also affected by mercury contamination due to mercury gold processing activities carried out in watersheds in the Mempawah Regency area (Aji et al., 2023) Even the largest river in West Kalimantan, the Kapuas River, is also not spared from the high potential for mercury exposure (Kompas, 2024). In September 2024, the West Kalimantan provincial government inaugurated a mercury-free gold processing facility in Teluk Geruguk village, Boyan Tanjung, Kapuas Hulu. This is due to the three largest gold mining sites in three sub-districts: Boyan Tanjung, Bunut Hilir and Bunut Hulu. The local government hopes that this technology is part of the local government's commitment to protecting the environment and supporting the central government's program to support the RAN-PPM (National Action Plan for Mercury Reduction and Elimination).

(a)

(b)

Figure 3: Amalgam burning process to separate gold and mercury (a) and Gold trading place at ASGM site (b) (Source: Nexus3)

Impact on Public Health

In 2023, Nexus3 Foundation and Wonjin Institute for Occupational and Environmental Health (WIOEH) checked the condition of long-term mercury exposure in two gold processing communities in Sukabumi, West Java, with one control village. Hair samples were taken from gold processors, their families, and non-gold processing communities. In addition, we also attached *passive air samplers* to some gold processors for 9 hours to detect mercury exposure in the air during work. Test results showed that residents in ASGM communities had higher exposure than control villages, even among residents who were not processing gold. Monitoring mercury in the air showed that gold processors were exposed to mercury 2.6 times higher than the safe *limit* (TLV-TWA/Threshold *Limit Value-Time Weighted Average*) when burning amalgam for 15 minutes.

In 2024, Nexus3 Foundation took hair, blood and IQ samples from children in Sekotong, West Lombok, West Nusa Tenggara. This sampling is the first step to see the potential and impact of mercury contamination on the development of children, especially those aged 8-14 years. This initial research showed that mercury was present in the hair and blood of the children tested. The results in the hair indicate mercury contamination that occurs on a chronic basis. In contrast, mercury in the blood indicates momentary exposure or is sourced from the food/drink they consume daily. Consumption of marine fish is also one of the significant mercury exposures because based on the results of the Nexus3 Foundation's research on marine fish in the West Nusa Tenggara region, most of the fish samples taken exceeded the required weekly tolerance limit (*Estimated Weekly Intakes*) of 4 μg/kg per week (FAO, 1983).

Impact on Biodiversity

Nexus3 Foundation has examined biota samples from marine fish and wild birds. Based on the monitoring results, fish in 8 provinces (West Sumatra, DKI Jakarta, West Java, East Kalimantan, Central Sulawesi, North Sulawesi, and West Nusa Tenggara) showed Hg contamination in fish, especially in muscle tissue. The tissue could be the main accumulation site of Hg in fish species. This confirms previous findings conducted by Suami et al., 2018. The Hg contamination can occur through direct absorption from the aquatic environment and/or Hg-contaminated food sources. The process in the food chain will then lead to Hg biomagnification. As for wild birds, 114 individuals from 30 species were caught in North Sumatra and 37 individuals from 17 were caught in Sukabumi District.

The results show that the mercury concentration of fur samples is generally higher than blood samples. Feather samples have characteristics that indicate that mercury pollution occurs accumulatively and over a longer period (Sabadková et al., 2024). On the other hand, blood samples show that mercury contamination occurs over a shorter period (Kahle and Becker, 1999), such as when birds eat mercury-contaminated food. In ASGM-affected areas, mercury concentrations in bird samples tend to be higher than in control areas, this is due to the massive use of mercury and the community's habit of disposing of post-gold extraction waste using mercury which is discharged into water bodies such as rivers (Tomiyasu et al., 2019) and soil (Kurniawan et al., 2023) so that it can potentially pollute the environment and biota living in the area.

Mercury Remediation

Nexus3 Foundation researched remediation methods to overcome mercury pollution in soil using adsorption techniques with biochar materials (Kusnarta et al., 2024) and phytoremediation techniques using vetiver grass conducted in West Nusa Tenggara in collaboration with the Faculty of Agriculture, Mataram University. The results from the lab scale prove that the combination of mercury immobilization/adsorption and phytoremediation methods shows the potential of using these two materials for mercury-contaminated soil remediation. A process to scale up the remediation is needed to prove success in the field. In addition, the Nexus3 Foundation is also working with the Faculty of Medicine, University of Mataram and Amman Mineral Nusa Tenggara to provide methylmercury testing equipment (University of Mataram, 2024). Methyl mercury is an organic mercury with a higher risk than elemental or inorganic mercury. Thus, this tool is expected to increase awareness of mercury in a more deadly form.

Mercury exported to Indonesia

Figure 4 shows the amount of mercury exported to Indonesia based on export data of several partner countries from 2015 to 2024. Based on the database, the total mercury exported to Indonesia until 2024 is around USD 36 thousand.

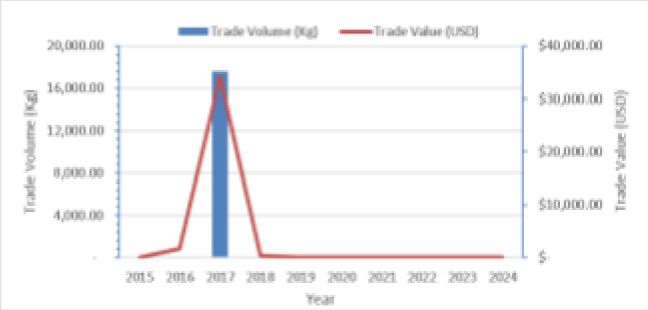

Figure 4. Mercury exported by trading partners to Indonesia 2015-2024
Source: UN Comtrade database

Table 1 shows the partner countries that export mercury to Indonesia. From 2015 to 2024, the total mercury exported by Indonesia's partner countries is around 1,700 tons, valued at around USD 36 thousand. However, the amount of mercury legally imported by Indonesia varies, as in table 2.

Year	Trade Volume (Kg)	Trade Value (USD)		Trade Partners
2015	-	$	-	-
2016	5.00	$	1,718.25	Singapore
2017	17,620.00	$	34,326.96	Singapore
2018	0.50	$	286.02	Singapore
2019	-	$	-	-
2020	-	$	-	-
2021	-	$	-	-
2022	-	$	-	-
2023	-	$	-	-
2024	-	$	-	-
TOTAL	17,625.50	$	36,331.23	

Table 1. Amount of mercury exported by trading partners to Indonesia 2015-2024
Source: UN Comtrade database

Mercury imported by Indonesia

On the other hand, if we look at the import data of HS code 280540 reported by Indonesia between 2015-2025, a different figure emerges when compared to the export data from partner countries, which is much less than the amount reported by partner countries. Figure 2 shows the mercury import data reported by Indonesia in the UN Comtrade database.

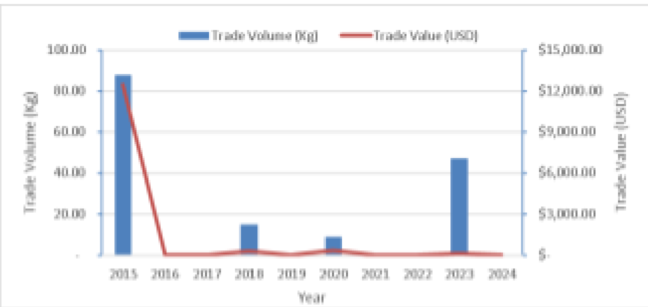

Figure 5. Mercury imported by Indonesia from trading partners 2015-2024
Source: UN Comtrade database

Table 2 shows the amount of mercury imported in kg and value (in USD) from partner countries between 2014 and 2024 based on Indonesian import data recorded in the UN Comtrade database.

Year	Trade Volume (Kg)	Trade Value (USD)		Trade Partners
2015	88.00	$	12,450.00	USA
2016	-	$	-	-
2017	-	$	-	-
2018	15.00	$	283.00	China, USA
2019	-	$	-	-
2020	9.00	$	322.00	China, USA
2021	-	$	-	-
2022	-	$	-	-
2023	47.00	$	136.00	China
2024	-	$	-	-
TOTAL	159.00	$	13,191.00	

Table 2. Mercury imported by Indonesia from trading partners 2015-2024
Source: UN Comtrade database

Mercury Export Import Data Discrepancies

The difference in import data recording as presented in Table 3 is due to differences in partner country identification methods where the current Indonesian system only records imports based on the country of origin. The current system does not record the application and existence of transit of consignments in third countries before the vessel carrying the goods to the export destination (destination country) as applied by other partner countries.

Year	INDONESIA REPORTS			TRADE PARTNERS REPORTS			DISCREPANCIES (Indonesia VS Trade Partners Reports)			
	Trade Volume (Kg)	Trade Value (USD)	Trade Partners	Trade Volume (Kg)	Trade Value (USD)	Trade Partners	Trade Volume (Kg)	Trade Value (USD)	Indonesia Reports Missing	Trade Partner Report Missing
2015	88.00	$ 12,450.00	USA	-	$ -	-	88.00	$ 12,450.00	-	USA
2016	-	$ -	-	5.00	$ 1,718.25	Singapore	5.00	$ 1,718.25	Singapore	-
2017	-	$ -	-	17,620.00	$ 34,326.96	Singapore	17,620.00	$ 34,326.96	Singapore	-
2018	15.00	$ 283.00	China, USA	0.50	$ 286.02	Singapore	14.50	$ (3.02)	Singapore	China, USA
2019	-	$ -	-	-	$ -	-	-	$ -	-	-
2020	9.00	$ 322.00	China, USA	-	$ -	-	9.00	$ 322.00	-	China, USA
2021	-	$ -	-	-	$ -	-	-	$ -	-	-
2022	-	$ -	-	-	$ -	-	-	$ -	-	-
2023	47.00	$ 136.00	China	-	$ -	-	47.00	$ 136.00	-	China
2024	-	$ -	-	-	$ -	-	-	$ -	-	-
TOTAL	159.00	$ 13,191.00		17,625.50	$ 36,331.23		-17,466.50	-$23,140.23		

Table 3. Differences in mercury export and mercury import data trading partner countries and Indonesia 2015-2024
Source: UN Comtrade database

Mercury exported from trading partners

From 2015 to 2023, Indonesia still exports mercury (HS code 280540) to several partner countries. This data was obtained from the UN Comtrade database by tracking export data reported by Indonesia to partner countries from 2015 to 2023, presented in Table 4.

Year	Trade Volume (Kg)	Trade Value (USD)		Trade Partner
2015	283,767.00	$	2,615,999.00	China, Eritrea, China Hong Kong SAR, India, Malaysia, Netherlands, Papua New Guinea, Poland, Singapore, Switzerland, Thailand, Timor-Leste, United Arab Emirates, USA, Viet Nam
2016	680,440.00	$	4,119,385.00	Colombia, China, Hong Kong SAR, India, Japan, Pakistan, Panama, Papua New Guinea, Singapore, South Africa, Thailand, United Arab
2017	151,854.00	$	1,790,437.50	China, India, China Hong Kong SAR, Japan, Netherlands, Singapore, South Africa, Thailand, Togo, United Arab Emirates,
2018	4.80	$	1,555.67	Japan, Papua New Guinea
2019	-	$	686.78	Japan, Switzerland
2020	-	$	553.93	Japan, United Kingdom
2021	-	$	406.00	Japan
2022	-	$	799.00	Japan
2023	-	$	299.00	Japan
TOTAL	1,116,065.80	$	8,530,121.88	

Table 4. Mercury Exports (HS 280540) from Indonesia to trading partners 2015-2023
Source: UN Comtrade database

Indonesia must immediately stop mercury exports, based on the Minamata Convention ratified through Law Number 11 of 2017, which aims to protect human health and the environment from the effects of mercury. This obligation is reinforced by national regulations such as Law No. 32/2009 on Environmental Protection and Management, ministerial regulations related to mercury control, the National Action Plan for Mercury Reduction and Elimination (RAN-PPM), as well as efforts to draft a trade ministerial regulation to ban mercury exports, thus creating a strong legal framework for mercury export termination.

Importance of the Minamata Convention Amendment in Ending Mercury Trade and Promoting its Elimination in ASGM by 2032

For the Minamata Convention to be considered effective, global mercury trade and its use in ASGM should have decreased since the convention came into force. However, according to the latest data in 2017, 1,200 tons of mercury were still legally traded globally. Five years after the convention came into force, this number has increased to 1,700 tons by 2022, representing a 40% increase in the global mercury trade. While there was a decline in mercury trade from 3,500 tons in 2013 (when the convention was signed) to 1,200 tons in 2017, the decline was more due to the phase-out of mercury use in industrial products and processes, which reduced demand.

The second weakness of the Minamata Convention is that there is no clear time limit for reducing mercury use in ASGM. This gives the impression that mercury use in the sector will continue to be tolerated, while elimination efforts are voluntary and dependent on national policies through the National Action Plan (NAP). In contrast to mercury use in other sectors regulated under the convention, ASGM is the only sector without a phase-out target.

Eliminating mercury use in ASGM will help governments protect sensitive areas, enhance national security, reduce illegal gold smuggling, and protect indigenous peoples and other vulnerable groups. In addition, supporting a national ban on the import and use of mercury in mining can reduce the risk of mercury pollution at national, regional and global levels. Legal small-scale gold mining can still operate by applying mercury-free extraction methods.

IPEN proposes to end global mercury trade and mercury use in ASGM be phased out by 2032, coinciding with the end of primary mercury mining as stipulated in the Minamata Convention. With a clear deadline, NAP countries can update their strategies to accelerate mercury elimination and introduce safer gold extraction methods. In addition, funding support for countries implementing NAPs will continue.

Stopping the international trade of mercury and its use in ASGM will facilitate customs control. All mercury shipments, except those destined for disposal, would be considered illegal and could be seized for stabilization and safe disposal. This measure would significantly reduce the flow of mercury into ASGM and make smuggling easier to detect. In addition, the Minamata Secretariat should provide guidance on procedures for the confiscation and storage of confiscated mercury when these amendments come into force.

Temporary and Final Storage of Confiscated Mercury and Mercury-Containing Waste in Indonesia

In Indonesia's National Action Plan for Mercury Reduction and Elimination (RAN-PPM) based on Presidential Regulation No. 21 of 2019, one of the priority sectors in the RAN-PPM is eliminating mercury use in Small Scale Gold Mining (ASGM). Some of the activities in this priority sector are conducting supervision and control of unlicensed primary mercury (cinnabar) mining and law enforcement activities. Law enforcement officials in Indonesia have also been working to address the illegal circulation and trade of mercury. Several cases of illegal mercury circulation and trade in Indonesia have been processed in court, resulting in court decisions. Based on court decision data published by the Supreme Court of the Republic of Indonesia, the following table shows a recapitulation of the amount of confiscated mercury and cinnabar recorded from 2017 to 2023:

Year	Confiscated mercury (kg)	Confiscated cinabar (kg)
2017	5,578.50	5,125.11
2018	13,293.57	3,561.30
2019	357.00	0
2020	2,249.00	6.00
2021	19,921.00	61.00
2022	3,253.29	0
2023	72.05	0
Total	44,724.41	8,753.41

Table 5. Recapitulation of the number of mercury and cinnabar seized in Indonesia in 2017-2023 (Source: database of court decisions of the Indonesian Supreme Court summarized by CRPG)

The recapitulated data on the amount of mercury and cinnabar confiscated above does not yet show the actual amount of mercury and cinnabar circulating illegally in Indonesia, as law enforcement still needs to be improved, given the location of ASGM hotspots spread almost throughout Indonesia. In Indonesia, court rulings on confiscated mercury and cinnabar mostly state that the evidence (both mercury and cinnabar) is "confiscated for destruction". Law enforcement officials, especially the Attorney General's Office of the Republic of Indonesia, as the executor of these court decisions, do not yet have clear guidelines for the identification and handling of mercury evidence and the implementation of "destruction" of mercury evidence from court decisions. Currently, the Attorney General's Office of the Republic of Indonesia, in collaboration with CRPG (Center for Regulation Policy and Governance) and Nexus3 Foundation, is developing guidelines for handling mercury evidence and evidence containing mercury, including guidelines for safe temporary storage of mercury evidence.

Indonesia's RAN-PPM includes plans for feasibility studies and detailed design plans for mercury interim and final storage sites, as well as plans for the provision of mercury interim and final storage sites, but these have not been implemented to date, and there are no mercury storage sites, either interim or final, in Indonesia.

Mercury-containing waste management in Indonesia is only available at PT PPLI (Prasadha Pamunah Limbah Industri). However, the mercury-containing waste management facility at PT PPLI can only manage mercury-containing waste with a maximum content of 260 ppm. Mercury waste or mercury-containing waste with a mercury content of more than 260 ppm will be sent to countries abroad with more adequate mercury waste treatment facilities. Meanwhile, there is no general data on mercury waste or mercury-containing waste that can be accessed by the public in Indonesia.

Conclusions and Recommendations

Conclusion

Indonesia faces major challenges in eliminating mercury use in Small Scale Gold Mining (ASGM), despite having ratified the Minamata Convention since 2017. While there are national regulations such as Presidential Regulation No. 21/2019 on the National Action Plan for Mercury Reduction and Elimination (RAN-PPM), implementation remains weak. The illegal trade in mercury continues, with Indonesia being a global exporter of mercury, even though such exports are against its international commitments. Mercury's impact on health and the environment is also increasingly evident, with evidence of contamination of humans, aquatic biota, and soil at various ASGM sites in Indonesia.

Recommendations Towards COP-6:

- Strengthening law enforcement needs to be done by increasing supervision of the trade and distribution of illegal mercury and tightening the implementation of the ban on mercury exports and imports.
- Amendments to the Minamata Convention should be encouraged to end global mercury trade and to set a target of eliminating mercury use in ASGM globally by 2032, thus providing a clear deadline for member states to reduce and eliminate mercury use.
- The development of alternative technologies needs to be accelerated by encouraging the adoption of mercury-free gold extraction methods and improving ASGM communities' access to safer and more sustainable technologies.
- Storage and management of confiscated mercury should be ensured by providing safe temporary and final storage facilities, and clarifying legal procedures for the destruction of confiscated mercury.
- International funding and collaboration need to be strengthened by accessing more funding sources from global mechanisms such as GEF and GCF to support ASGM transition to mercury-free practices to support mercury elimination efforts in ASGM.
- Encourage all provinces and districts/cities to develop and implement Regional Action Plans (RAD) to achieve the national target of a mercury-free Indonesia by 2030.

Reference

Agrawal, S., Susilorini, B., (2020). National Overview of the Indonesian ASGM Sector. https://rc-sea.org/wp-content/uploads/2021/12/National-Overview-of-ASGM-in-Indonesia-FINAL-31-Oct-2020.pdf

Aji, T B., Setiawan, Y., Abidin, Z. (2025). Kajian Analisis Risiko Merkuri Terhadap Lingkungan dan Kesehatan di Kabupaten Sintang, Kalimantan Barat. IPB University Repository. Retrieved February 11, 2025, from http://repository.ipb.ac.id/handle/123456789/116728

Dinas Komunikasi dan Informatika (Diskominfo) Kapuas Hulu. (2024, September 17). Bupati Kapuas Hulu resmikan fasilitas pengolahan emas bebas merkuri di Desa Teluk Geruguk. Diskominfo Kapuas Hulu. Retrieved February 11, 2025, from https://www.diskominfo.kapuashulukab.go.id/berita/bupati-kapuas-hulu-resmikan-fasilitas-pengolahan-emas-bebas-merkuri-di-desa-teluk-geruguk/

Kurniawan, I. A., Abdurrachman, M., Sakakibara, M., Xiaoxu, K., Meilano, I., Basuki, N. I., Sucipta, I. G. B. E., & Arifa, A. N. (2023). Mercury Exposure from Artisanal Small-Scale Gold Mining in Bunikasih, West Java, Indonesia (pp. 95–98). https://doi.org/10.1007/978-3-031-43803-5_21

FAO. (1983). Compilation of legal limits for hazardous substances in fish and fishery products. In the Library.

Kahle, S., & Becker, P. H. (1999). Bird blood as bioindicator for mercury in the environment. Chemosphere, 39(14), 2451–2457. https://doi.org/10.1016/S0045-6535(99)00154-X

Kompas. (2024, November 14). Pilkada Kalbar: Kratom hingga pertambangan emas ilegal diangkat kontestan. Kompas.id. Retrieved February 11, 2025, from https://www.kompas.id/baca/nusantara/2024/11/14/pilkada-kalbar-kratom-hingga-pertambangan-emas-ilegal-diangkat-kontestan/

Kusnarta, I. G. M., Suwardji, S., Fahrudin, F., Sukartono, S., Wangiyana, W., Huda, B. N., Ismaranti, Y. M., Ismawati, Y. Y., Maharani, A., Fokke, B., & Bensaïah, C. (2024). Effectiveness of Different Sources of Biochar for Immobilizing Mercury in Soil from Artisanal and Small-Scale Gold Mining Areas in Taliwang Village of West Sumbawa Regency, Indonesia. International Journal of Design & Nature and Ecodynamics, 19(5), 1627–1634. https://doi.org/10.18280/ijdne.190516

Liputan4. (2024, December 3). Pertambangan emas ilegal di Sintang, masyarakat desak penegakan hukum yang tegas dalam hal pemberantasan dan penertiban. Liputan4. Retrieved February 11, 2025, from https://liputan4.com/pertambangan-emas-ilegal-di-sintang-masyarakat-desak-penegakan-hukum-yang-tegas-dalam-hal-pemberantasan-dan-penertiban/

Male, Y. T., Reichelt-Brushett, A. J., Pocock, M., & Nanlohy, A. (2013). Recent mercury contamination from artisanal gold mining on Buru Island, Indonesia–Potential future risks to environmental health and food safety. *Marine pollution bulletin*, *77*(1-2), 428-433.

Male, Y. T., Reichelt-Brushett, A., Burton, E. D., & Nanlohy, A. (2024). Assessment of mercury distribution and bioavailability from informal coastal cinnabar mining-Risk to the marine environment. *Marine pollution bulletin*, *199*, 116047.

Pontianak Times. (2024, June 30). Genderang perang Kapolda untuk pelaku PETI di Kalbar. Pontianak Times. Retrieved February 11, 2025, from https://pontianak-times.co.id/genderang-perang-kapolda-untuk-pelaku-peti-di-kalbar/

Sabadková, T., Janiga, M., Korňan, J. et al. Mercury in the feathers of Golden eagle (Aquila chrysaetos) from Western Carpathian, Slovakia. Environ Sci Pollut Res 31, 26527–26535 (2024). https://doi.org/10.1007/s11356-024-32673-8

Suami, R. B., Sivalingam, P., Kabala, C. D., Otamonga, J. P., Mulaji, C. K., Mpiana, P. T., & Poté, J. (2018). Concentration of heavy metals in edible fishes from Atlantic Coast of Muanda, Democratic Republic of the Congo. Journal of Food Composition and Analysis, 73(June), 1–9. https://doi.org/10.1016/j.jfca.2018.07.006

Tomiyasu, T., Hamada, Y. K., Kodamatani, H., Hidayati, N., & Rahajoe, J. S. (2019). Transport of mercury species by river from artisanal and small-scale gold mining in West Java, Indonesia. Environmental Science and Pollution Research, 26(24), 25262–25274. https://doi.org/10.1007/s11356-019-05718-6

UN Environment, 2017. Global mercury supply, trade and demand. United Nations Environment Programme, Chemicals and Health Branch. Geneva, Switzerland.

Universitas Mataram. Kolaborasi FK Unram dengan PT AMNT dan Nexus3 Foundation berkomitmen wujudkan NTB bebas merkuri. Universitas Mataram. Retrieved February 11, 2025, from https://unram.ac.id/id/berita/kolaborasi-fk-unram-dengan-pt-amnt-dan-nexus3-foundation-berkomitmen-wujudkan-ntb-bebas-merkuri/