

**Illicit Mercury Flows and  
Governance Practices  
in Mindanao, Philippines**



## ABOUT BAN TOXICS

BAN Toxics is an independent non-government environmental organization that works for the advancement of environmental justice, health and sustainable development in the area of chemicals and wastes, with a special focus on women, children and other marginalized sectors.

We work closely with government agencies, communities and civil society, national, and international levels to reduce and eliminate the use of toxic chemicals and support global sustainable development goals through education campaigns, community grassroots interventions, training and capacity-building, policy research and development and advocacy programs.

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The views expressed in this publication do not necessarily reflect those of BAN Toxics or IUCN NL.

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## LIST OF ACRONYMS AND ABBREVIATIONS

<b>ASGM</b>	Artisanal and Small Scale Gold mining
<b>BSP</b>	Bangko Sentral ng Pilipinas/Central Bank of the Philippines
<b>CSO</b>	Civil Society Organizations
<b>CCO</b>	Chemical Control Order
<b>DAO</b>	Department Administrative Order
<b>DENR</b>	Department of Environment and Natural Resources
<b>DOF</b>	Department of Finance
<b>DOLE</b>	Department of Labor and Employment
<b>EIS</b>	Environmental Impact System
<b>ENRO</b>	Environment and Natural Resources Office
<b>EO</b>	Executive Order
<b>FGD</b>	Focus Group Discussion
<b>IUCN</b>	International Union for Conservation of Nature
<b>KII</b>	Key Informant Interview
<b>LGU</b>	Local Government Unit
<b>MGB</b>	Mines and Geosciences Bureau
<b>MENRO</b>	Municipal Environment and Natural Resources Office
<b>NBI</b>	National Bureau of Investigation
<b>NGO</b>	Non-Government Organization
<b>PEMO</b>	Provincial Environmental Management Office
<b>PENRO</b>	Provincial Environment and Natural Resources Office
<b>RA</b>	Republic Act
<b>SRJS</b>	Shared Resources Joint Solutions
<b>UN</b>	United Nations
<b>UN COMTRADE</b>	United Nations International Trade Statistics Database

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**T**he Artisanal and Small-Scale Gold Mining (ASGM) sector is the primary anthropogenic sources of mercury pollution in the Philippines. This mercury is sourced from a number of countries such as China, Indonesia, and Malaysia and enters the country through various means – both formal and informal.

The majority of the mercury in the Philippines enters through Mindanao, one of the three major islands in the country. This mercury is transported discreetly through land and sea, and may even reach ASGM communities as far as Benguet, in Luzon.

Mercury use is heavily linked to the informality of the ASGM sector. The illicit gold and mercury markets, which have persisted due to the sector's informality, exercise authority over the ASGM sector. This authority has led to extreme poverty and continued mercury use in mining communities (as mercury serves as a way to augment incomes for most gold traders and financiers).

Informality has also contributed immensely to mercury governance issues. As ASGM remains informal, corrupt government officials and police tend to take advantage of the sector (through extortion or through trading mercury). There is little incentive for them to eliminate mercury use. In contrast, the lack of regulation and formality in the sector allows them to profit from it.

Mercury use is a social issue as much as it is an environmental issue – the research asserts that the use of mercury contributes to health risks, reduced economic opportunities, and is a major factor preventing formalization

in mining communities. As mercury contributes to perpetuating poverty cycles, many miners are unable to stop using mercury.

A key finding of the study is the fact that most miners are unable to stop using mercury due to various industry and market factors such as the inaccessibility of alternative mercury-free technologies, pressure from financiers/mercury traders to continue using mercury, and the lack of practical knowledge on mercury and its risks, among others.

Responding to the social, economic, and cultural needs of the ASGM sector, the elimination of mercury use is imperative. Miners will only be able to stop using mercury when they are given the chance to access safer alternatives and better economic opportunities.

To discourage the mercury trade, the study recommends a shift in perspective for regulating agencies. Crackdowns and regulations should focus on mercury traders rather than miners, as the fact that miners are unable to stop using mercury due to external factors. Mercury traders, on the other hand, play a significant role in perpetuating mercury use in ASGM communities.

# 1. INTRODUCTION

This report documents the illicit mercury flows in Mindanao, Philippines as well as the various governance practices for mercury in the study areas. The study is conducted by **BAN Toxics** and focuses on **Artisanal and Small-Scale Gold Mining** (ASGM) communities in the island, where the majority of illicit mercury enters the country.

## 1.1. Organizational Background

**BAN Toxics** is an independent non-government environmental organization that works for the advancement of environmental justice, health, and sustainable development in the area of chemicals and wastes with a special focus on women, children, and other marginalized sectors.

The organization works closely with government agencies, communities, and civil society at the local, national, and international levels to reduce and eliminate the use of toxic chemicals and support global sustainable development

goals through education campaigns, community grassroots interventions, training and capacity-building, policy research and development, and advocacy programs.

In its work on mercury, BAN Toxics has been a consistent presence in advocating for the ratification of the Minamata Convention in the Philippines. The organization has also worked closely with various local and international ASGM communities in an effort to reduce its mercury emissions such as in Cambodia, Mongolia, Indonesia, Uganda, and Tanzania.

## 1.2. Context of the Study

Mercury and mercury compounds are highly toxic substances that pose significant risks to human and environmental health. According to the World Health Organization,<sup>1</sup> mercury is considered one of the top ten chemicals of major public health concern.

Mercury in its most toxic forms is capable of bio-accumulating in living organisms, and bio-magnifying through the food chain. As predators eat other organisms containing mercury over time, mercury can accumulate within them in levels that are greater than in their habitats or their food. As it bio-magnifies through the food chain, mercury can also potentially be transported across wide distances.<sup>11</sup> These transport and transformation mechanisms allow mercury to pollute long distances and contaminate global food supplies at levels which pose significant risks.

Globally, the primary source of mercury pollution comes from the ASGM sector, where mercury is used to produce gold.<sup>111</sup> As much as 37% of total anthropogenic mercury emissions to the global atmosphere are directly linked to ASGM, the majority of which operate informally and in poverty.

“Mercury and mercury compounds are highly toxic substances that pose significant risks to human and environmental health.”

In countries such as the Philippines, the use of mercury in ASGM persists despite government regulations designed to eliminate its use. This study investigates the factors that contribute to mercury’s continued use through an analysis of current trade and governance practices in Mindanao,<sup>1</sup> where the majority of illicit mercury enters the country.

This study is conducted by BAN Toxics in partnership with the **IUCN National Committee of the Netherlands** (IUCN NL) under the **Shared Resources, Joint Solutions** (SRJS) program.

1 Mindanao is the second largest island in the Philippines, and is one of the three major islands in the country aside from Luzon and Visayas.

## 2. STUDY OBJECTIVES AND METHODOLOGY

The study aims to assess the political ecology of mercury within the ASGM sector, with specific focus on the governance aspects of the mercury value chain. Specifically, the study aims to:

- Identify the formal and informal value chain for mercury in the project sites, including identifying the various sources and endpoints of mercury, how it is accessed by mine workers, and the prevailing market prices for both the formal and informal channels;
- Perform an in-depth analysis of the cultural, socio-political, and economic factors that lead to the continued use of mercury in ASGM, including an assessment of knowledge levels of key stakeholder groups on the negative impacts of mercury use, and the power dynamics that drive mercury trade, among others.
- Assess the effectivity and efficiency of the actions and projects implemented by local government units and critical hotspots and chokepoints to reduce mercury use in their communities.

### 2.1. Scope and Limitations of the Study

The study focuses on the mercury flows and governance practices in the Mindanao area, where the majority of illicit mercury enters the country. The study covers areas such as:

**Table 1: Primary Study Areas**

South Cotabato Province	Agusan del Sur Province
Saranggani Province	Davao City
Cagayan de Oro City	Zamboanga City
Tagum City	

Furthermore, the study takes into consideration results from previous reports by BAN Toxics in areas such as **Southern Leyte** (Visayas) and **Camarines Norte** (Luzon). Essentially, this study validates existing information and updates them based on results from the investigation.

Figure 1<sup>2</sup> illustrates the major islands of the Philippines, with Mindanao being the second largest island in the country with a land area of 97,350 km<sup>2</sup>.<sup>iv</sup>

Due to the sensitivity of the topic and the perceived security risks, a major limitation encountered during the conduct of the study is the reluctance of potential informants to participate. Moreover, a number of participants who did participate have, at times, chosen to withhold some information due to the perceived risks associated with revealing industry secrets. As such, sensitive information such as specific names of individuals controlling the mercury trade are not reported.

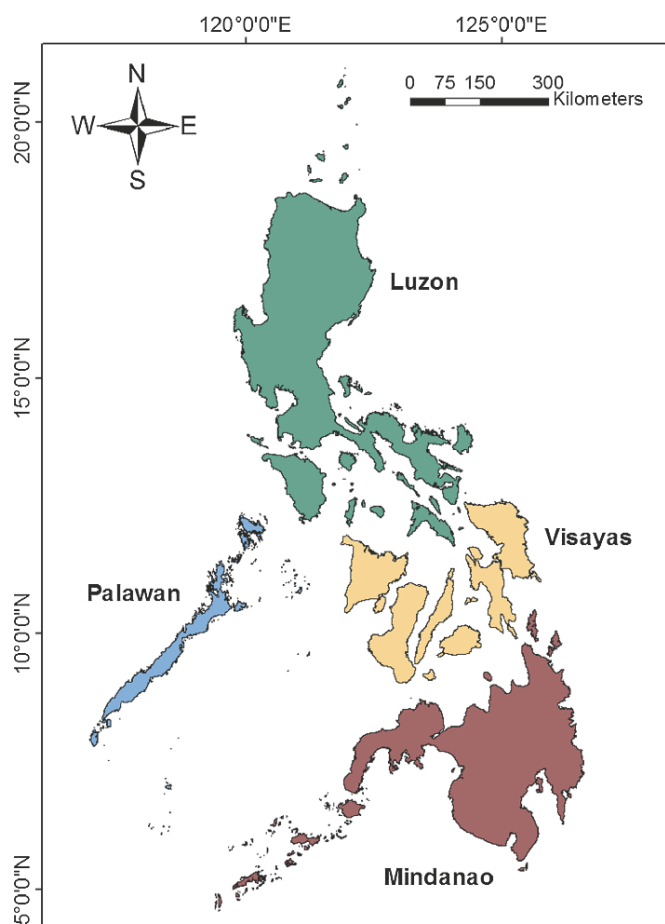


Figure 1: Major Islands of the Philippines (Source: Footnote 2)

2 Banag, C., Thrippleton, T., Alejandro, G., Reineking, B., Liede-Schumann, S. (2015). Bioclimatic niches of selected endemic *Ixora* species on the Philippines: predicting habitat suitability due to climate change. Published in *Plant Ecology*. Retrieved from: [https://www.researchgate.net/publication/281455710\\_Bioclimatic\\_niches\\_of\\_selected\\_endemic\\_Ixora\\_species\\_on\\_the\\_Philippines\\_predicting\\_habitat\\_suitability\\_due\\_to\\_climate\\_change](https://www.researchgate.net/publication/281455710_Bioclimatic_niches_of_selected_endemic_Ixora_species_on_the_Philippines_predicting_habitat_suitability_due_to_climate_change)



## 2.2. Methodology

The study takes the form of an investigative research focusing on unearthing perspectives and information on the illicit mercury trade and related governance practices. Various data collection methods were conducted during the course of the study including:

### b) Desk Research

Desk research was conducted focusing on current mercury and gold trading practices in and outside of the country. A number of information gathered through desk research such as trade practices, market prices, and other related issues were discussed and validated with respondents.

Current national policies concerning the ASGM sector and mercury were also reviewed. These policies, especially on the banning of mercury, were used as discussion points when discussing governance practices with stakeholders.



Finally, previous reports published or supported by BAN Toxics regarding ASGM and mercury use in the sector were also reviewed, including the 1) **ASGM Baseline and Gold Supply Chain Report for Camarines Norte and South Cotabato**,<sup>v</sup> the 2) **Socio-Economic and Environmental Assessment of Artisanal and Small-Scale Gold Mining (ASGM) Operations in Brgy. Pinut-an, San Ricardo, Southern Leyte**,<sup>vi</sup> 3) **Assessment of Mercury Flows in Artisanal and Small-Scale Gold Mining (ASGM) Communities in Mindanao, Philippines**,<sup>vii</sup> and 4) **Follow the Money: The Philippines**.<sup>viii</sup>

### c) Focus Group Discussions and Key Informant Interviews

Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) were conducted involving mining stakeholders. These activities were focused on discussions revolving around stakeholder perspectives on mercury use, information regarding mercury flows in the area, and existing government measures to control mercury trade.

The study consults 25 ASGM stakeholders who have experience or are currently working in the ASGM communities of the study areas (as indicated) including:

**Table 2: Research Respondents**

<b>Mining Stakeholders</b>	<b>Traders</b>	<b>Government Stakeholders</b>
Miners (South Cotabato, Tagum City, Agusan del Sur)	Gold Traders (Tagum City, Davao City, South Cotabato)	Provincial Environment Management Office (South Cotabato)
Financers (South Cotabato, Saranggani, Cagayan de Oro City, Zamboanga City)	Mercury Traders (Agusan del Sur, South Cotabato, Davao City)	Provincial Environment and Natural Resources Office (Davao del Sur)
Ball Mill Operators (South Cotabato, Saranggani, Cagayan de Oro City, Zamboanga City)		Local Government Stakeholders (South Cotabato, Tagum City)
Representatives from the Philippine National Coalition for Small-Scale Mining		

## 3. SECTOR OVERVIEW

The Philippines is considered one of the world's most mineral-rich countries, with significant deposits of minerals such as gold, nickel, copper, and chromite.<sup>ix</sup> Mining for gold, in particular, is potentially a lucrative venture – gold reserves in the country are projected to be worth around P7.36 trillion (USD 141.8 billion).<sup>x</sup>

ASGM is considered a valuable source of livelihood in the country. It is estimated that there are around 500,000 ASGM miners in the Philippines, with millions more indirectly depending on the sector for their livelihood.<sup>xi</sup> These small-scale gold mining operations can be found in as much as 40 provinces around the country.<sup>xii</sup> The ASGM sector is closely linked with extreme poverty – miners including women and children engage in mining due to the lack of economic opportunities that are available to them.<sup>xiii</sup>

Small-scale mining is generally considered illegal in the country. Because of this, the industry remains heavily unregulated with incidences of fatal accidents, child labor, and inhumane working conditions being reported but not being properly documented. Little has improved over the years; small-scale mining is still both an environmental and labor hazard.<sup>xiv</sup> Miners are often subjected to toxic chemicals and dangerous working conditions with little or no protection from inherent risks. Likewise, surrounding communities are also at risk of being exposed to the dangers of unregulated mining.

### 3.1. Mercury Use in ASGM

Mercury has been used in mining to produce gold for thousands of years.<sup>xv</sup> Mercury is used to extract gold from ores to form an amalgam. The amalgam is then subjected to heat (called smelting) to evaporate the mercury and isolate the gold. This poses significant environmental issues, with the global ASGM sector emitting and releasing as much as 410 to 1400 tons of mercury into the environment each year. Currently, the ASGM sector causes more mercury pollution than any other human activity.

Mercury has become a staple in ASGM communities including those in the Philippines. For most miners, the knowledge of using mercury to process gold has been passed down either by previous generations of miners or by miners from neighboring ASGM communities. Moreover, its ease of use and accessibility have turned mercury amalgamation into the only feasible way to produce gold for most of the poverty-driven industry.<sup>xvi</sup>

Figure 3 outlines the typical gold production process in the Philippines. For most operations in the country, mercury is used at ball mill processing facilities. Depending on the method employed by miners, mercury may also be used at different stages in the process. In Camarines Norte, for example, a number of miners have stated that mercury may be used as early as during initial extraction of ores, where these ores are panned in nearby rivers or waterbodies to separate gold from other materials.

In the past few years, BAN Toxics has conducted several mercury inventories involving gold processing facilities from various mining communities. These measurements show startling results with the average mercury used to produce a gram of gold ranging from 10.61g in Agusan del Sur to 48.1g in South Cotabato (Table 3).

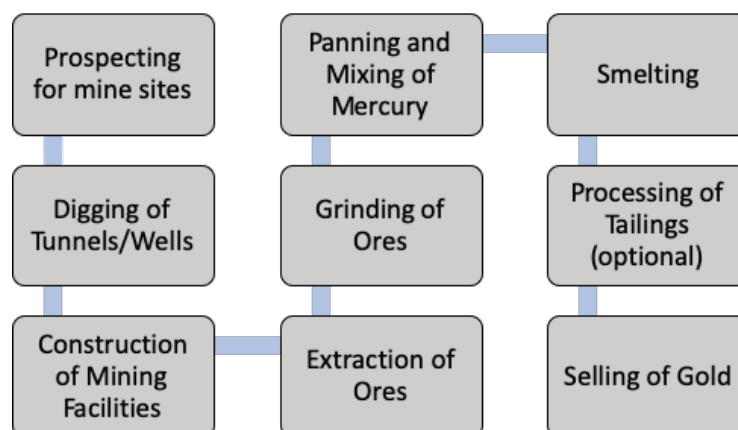


Figure 3: Gold Production Process in the Philippines (Source: BAN Toxics, ASGM Baseline Report)

The discrepancies between the average amount of mercury use per site are generally believed to depend on a number of factors. Firstly, mercury is used differently depending on the area. In areas where mercury is more easily accessible, for example, miners use mercury as early as during the panning stages.<sup>3</sup> In areas such as T'boli (where mercury restrictions are in place) on the other hand, miners are known to use mercury only during the gold processing stages. To compensate, miners may at times use a larger amount of mercury when processing gold.



The informality of the sector is also apparent when evaluating mercury use practices – miners do not use standardized mercury measuring techniques and instead rely on personal estimates in determining how much mercury is to be used. As such, miners may use wildly differing amounts of mercury even when processing the same kind and volume of ores and using the same techniques.

The table below outlines some of these findings including the year the measurements were conducted.

**Table 3: Inventory of Mercury Use, Emissions, and Releases in ASGM Communities**

	<b>Jose Panganiban &amp; Labo, Camarines Norte</b>	<b>Brgy. Mt. Diwata, Compostela Valley</b>	<b>Brgy. Bayugan, Agusan del Sur</b>	<b>T'boli, South Cotabato</b>
<b>Year</b>	2015	2015	2017	2017
<b>No. of Operations</b>	18	27	3	5
<b>Average Hg/gold (gram)</b>	34.3	10.7	10.61	48.1

With ASGM responsible for producing the majority of gold in the country, the amount of mercury smuggled into the Philippines may be significantly higher than official numbers – conservative estimates<sup>xvii</sup> show that around 35 to 105 tons (30,000 to 95,000 kg) of mercury are used in ASGM activities around the country. In comparison, UN Comtrade data report that only 428 kg of mercury were legally imported to the Philippines in 2016.<sup>xviii</sup>

The difference in estimated mercury use and emissions from ASGM in the Philippines and the amount of legally imported mercury is indicative of the extent of illegal mercury and gold trading that occurs in the country. With as much as 95% of the Philippine gold trade being controlled by smugglers,<sup>xix</sup> demand for mercury remains high.

### 3.2. Legislative Framework

ASGM and mercury use are governed by a number of national policies. The ASGM sector as a whole is governed by policies such as Republic Act 7076 (otherwise known as the People's Small-Scale Mining Act of 1991) and Executive Order 79. Mercury use, on the other hand, is governed by the Chemical Control Order for Mercury which was established in 1997. This chapter presents a brief overview of these policies.

<sup>3</sup> Panning refers to the separation of soil or gravel from the gold ores by washing them in a pan with water. This is mostly employed by ASGM miners when extracting gold ores.

### 3.2.1. National Policies on Small-Scale Mining

The ASGM sector is governed by RA 7076 and EO 79. RA 7076, or the People’s Small-Scale Mining Act of 1991, which provides guidelines on how to properly utilize the country’s mineral resources and develop the small-scale mining sector in the context of addressing the social, economic, technical, and environmental challenges in ASGM.<sup>xx</sup>

RA 7076 defines small-scale mining as “activities which rely heavily on manual labor using simple implements and methods and do not use explosives, or heavy mining equipment.”<sup>xxi</sup> There are no current definitions for medium-scale mining.

In 2012, EO 79 was enacted to support reforms in the ASGM sector. EO 79 is otherwise known as an act “*Institutionalizing and Implementing Reforms in the Philippine Mining Sector Providing Policies and Guidelines to Ensure Environmental Protection and Responsible Mining in the Utilization of Mineral Resources*” and aims to strengthen the protection

of the environment, the promotion of responsible mining, and the inclusion of better revenue-sharing practices in ASGM.

EO 79 aims to recognize small-scale mining as a formal sector, and reinforces existing measures such as:<sup>xxii</sup>

- Compliance with RA 7076 as well as the Environmental Impact Statement (EIS) System;
- The establishment of Peoples’ Small-Scale Mining Areas (Minahang Bayan) as requisites before small-scale mining operations can be conducted;
- The establishment of Provincial/City Mining Regulatory Boards to oversee mining activities in their areas;
- The limitation of small-scale mining to gold, silver, and chromite;
- The prohibition of mercury use;
- The mandate to provide technical assistance to small-scale mining cooperatives.

### 3.2.2. National Policies on Mercury Use

Republic Act 6969 (otherwise known as the **Toxic Substances, Hazardous and Nuclear Wastes Control Act of 1990**) serves as the country’s main framework on chemicals management.<sup>xxiii</sup> The policy aims to regulate, restrict, or prohibit the importation, manufacture, processing, sale, distribution, use, and disposal of toxic chemicals that pose health and environment risks.

For the use of mercury, Department Administrative Order (DAO) 1997-38, or the Chemical Control Order for Mercury and Mercury Compounds, was developed. The policy concerns the control and regulation of mercury trade, use, and disposal in the Philippines.<sup>xxiv</sup> The CCO outlines and specifies the following:

- Permits for the manufacture, distribution, importation, treatment, transport, and disposal of mercury including the specification of industries allowed to use mercury (Table 4);
- Reporting of mercury trade;
- Handling and storage of mercury, mercury compounds, and wastes;
- The formulation of a mercury management plan.

**Table 4: Allowable Uses of Mercury**

Chlor-alkali plants;	Mining and metallurgical industries; <sup>4</sup>
Electrical apparatus (lamps, arc rectifiers, battery cells, etc.)	Industrial and control instruments;
Paint manufacturing	Pulp and paper manufacturing;
Dental amalgam	Industrial catalyst
Pesticides	

4 The CCO lumps small-scale mining together with other metallurgical industries. However, EO 79 has fully prohibited the use of mercury in ASGM.

### 3.2.3. Related Policies on Enforcement and Governance

**Republic Act 7160**, otherwise known as the Local Government Code of 1991,<sup>xxv</sup> devolves a number of responsibilities of the national government to local government units (LGUs).<sup>5</sup> RA 7160<sup>xxvi</sup> aims to “transform local government units into self-reliant communities and active partners in nation-building by giving them more powers, authority, responsibilities, and resources.”<sup>xxvii</sup>

With RA 7160 in place, a number key responsibilities and duties are devolved to local government units, including the enforcement of various environmental laws such as RA 7076. Consequently, the regulation of small-scale mining may vary depending on the priorities and biases of local government units.

As stated in RA 7076, LGUs are mandated to comply with certain requirements such as the establishment of an Environment and Natural Resources Office (ENRO). Included in the responsibilities of the office is the promotion

of small-scale mining and the utilization of mineral resources, including gold. Beyond the establishment of the ENRO, LGUs are given the freedom and capacity to prioritize projects, activities, issues and concerns based on their preference.

As key responsibilities in the context of implementing environmental regulations are handed to the LGU, environmental programs across municipalities and provinces may greatly differ. Monitoring and regulation practices and legislation, then, as well as projects and activities may differ from municipality to municipality, depending on the priorities of the LGU. As an example, municipalities may enact certain environmental policies that are not present in other areas, such as T'boli's municipal ordinance on prohibiting the use of mercury in ASGM. The inconsistency in environmental regulation practices is further discussed in Section 4.4.



5 **Local Government Units** in the Philippines refers to provinces, independent cities, component cities, municipalities, and barangays. Barangays are the smallest administrative division in the country.

## 4. MERCURY TRADE OVERVIEW

Due to the secrecy surrounding illegal mercury trade, it is difficult to estimate just how much mercury is smuggled into the Philippines. Still, the fact is that mercury use remains at large. Research conducted by BAN Toxics (as discussed in Table 3, Section 3.1.) allude to high mercury use rates in ASGM communities and shows a glimpse of how accessible mercury is to miners. Evidence suggests that both legal and illegal mercury in the Philippines is sourced from neighboring countries (Figure 4)<sup>6</sup> such as China, Indonesia, and Malaysia, with the chemical entering the country through various illegal and legal means.

### Historical Mercury Sources and Trade

The majority of the mercury produced globally comes from cinnabar.<sup>xxviii</sup> These cinnabar ores are present around the world, with significant deposits in Europe and the United States.<sup>xxix</sup> Historically, the mining sites of Almadén (Spain) and Idrija (Slovenia) represented the two largest mercury mines in the world, with mercury production beginning in as far back as 1490.<sup>xxx</sup> Export bans in Europe and the USA, however, eventually led to the closure of these mining operations. Currently, the only known primary mercury mine in operation is located in Kyrgyzstan.<sup>xxxi</sup> The primary mercury mine in Khaidarkan, Kyrgyzstan reports total employment numbers of around 400 in 2019.<sup>xxxii</sup>



Figure 4: Neighboring Countries – Philippines (Source: Footnote 8)

Data from the United Nations' International Trade Statistics Database (UN COMTRADE)<sup>xxxiii</sup> show that between 2000 to 2011, the Philippines' legal mercury imports amounted to 295,000 kilograms, the majority of which came from Spain. The ban of mercury exports in Europe in 2017 and in the USA<sup>xxxiv</sup> in 2013 led to the rise of mercury trading hubs in Japan, Hong Kong/China, and Singapore. During this period, Japan became the primary source of mercury in the Philippines. UN Comtrade data from 2018 show that legal mercury imports to the Philippines only amounted to 34 kg, all of which came from Japan.<sup>xxxv</sup> In contrast, mercury continues to be used heavily in ASGM communities in the Philippines (Table 3).

### 4.1. Current Mercury Sources in the Philippines

Evidence suggests that mercury in the Philippines is sourced from neighboring countries (Figure 4)<sup>xxxvi</sup> such as China, Indonesia, and Malaysia, with the chemical entering the country through various illegal and legal means. China is also known to have mercury mines, but insists that it does not export their mercury. Indonesia is considered the world's largest exporter of mercury,<sup>xxxvii</sup> despite the fact that mercury use is prohibited in Indonesia.<sup>xxxviii</sup>

The following sections discuss these findings in detail, as well as the various *modus operandi* utilized by mercury smugglers.

#### 4.1.1. Mercury Smuggled through Formal Ports

Mercury from countries such as Indonesia, China, and Malaysia are smuggled to the country through various means. One such method used by smugglers in the country is by shipping mercury through formal ports by bribing customs officials, misdeclaration of their shipments, or a combination of both. Although no definitive data exists, informant interviews suggest that the majority of mercury used in ASGM comes from Indonesia.

6 Nations Online Project (n.d.). Political map of South China Sea. Retrieved from: <https://www.nationsonline.org/oneworld/map/South-China-Sea-political-map.htm>

### Mercury from China

Mercury sourced from China is called locally as “*apollo*” based on the container labels that reach miners. This mercury is often cheaper than mercury coming from other sources, with miners claiming that mercury from China often leaves visible spots in the gold that they process. Mercury sourced from China is believed to be shipped directly to Chinese businessmen in the Philippines.

The practice of bribing of customs officials and the misdeclaration of shipments are rampant in Mindanao. In a discussion with Davao City’s Provincial Environment and Natural Resources Office (PENRO), it was revealed that mercury is often shipped with other illegal goods and the smuggling practices are similar.

In a discussion with the PENRO, it was revealed that customs officials are often bribed whenever mercury shipments arrive, and these customs officials in turn

provide smugglers with details regarding the day’s shipment inspections. Since port inspectors will only inspect specific containers within a given shipment, smugglers are able to ship mercury into the country by placing mercury in containers which are not scheduled to be inspected for the day.

This information was validated in our interview with a former mercury trader who also informed us that the advent of better inspection technologies such as x-rays has made it harder to smuggle mercury through formal ports. The improved technology means that bribes are higher, while the risks of smuggling successfully may not be fully guaranteed. This former mercury trader, a pure Chinese individual who grew up in the Philippines, also confirmed that Chinese traders in the Philippines may ship mercury directly from their contacts in mainland China.



### Mercury from Indonesia and Malaysia

Mercury coming from Indonesia is called locally as “*masher*” based on the container labels. Most miners prefer mercury sourced from Indonesia due to the perceived quality improvements over mercury from China. Mercury is often placed in sealed tube drums similar to fire extinguishers. An informant from Tagum City suggested that these tube drums may weigh as much as 33 kg each, however, this was not confirmed by other groups interviewed for this study.

A 2017 report from Indonesian NGO BaliFokus<sup>xxxix</sup> noted that it is common practice among Indonesian mercury traders to put fake German or Spanish labels on their mercury, as miners are more likely to buy mercury from European countries due to the perceived differences in quality. This

was reinforced by an informant reporting that the container labels for mercury sometimes say that they originate from Germany. As it is generally believed that it may be difficult to ship contraband from Germany due to the distance between the two countries, this “German” mercury is most likely mislabeled Indonesian mercury.

In the case of Malaysia, mercury is legally imported from sources such as Indonesia, Singapore, Hong Kong, and China before the mercury is smuggled to the Philippines. Informants have also suggested that the majority of mercury coming from Malaysia may originate from Indonesia, due to the fact that most mercury containers from Malaysia are labeled as Indonesian.

### General Smuggling Practices

A number of high-profile incidents linking the aforementioned countries to illegal mercury trade occur continually. In 2014, the Bureau of Customs in the Philippines seized around 360 kilograms of mercury smuggled from China.<sup>xi</sup> These shipments were consigned by private companies such as Greyboid Corp., Thunderdragon Foods, and Agricultural Products Import-Export Corp. and entered the country through the Manila International Container Port.<sup>xii</sup> A year after, at least 14 shipping containers bound for Hong Kong and the Philippines were seized by Indonesian Customs. These contained cinnabar and mercury, with some of the containers being accompanied by false export declarations.<sup>xiii</sup>

Mercury also enters the country illegally through Mindanao's formal ports. With our proximity to neighboring countries, fishing boats from both Indonesia and Malaysia are known to smuggle mercury through major ports in Mindanao (Davao City, Cagayan de Oro City, Zamboanga

City, and Saranggani Province). Customs officials have confirmed that the island has become a drop-off point for smuggled mercury in the country as supported by incidents in the area. In 2011, a 20-foot motorized vessel carrying 500 kilograms of mercury sank in Saranggani Bay.<sup>xiiii</sup>

Another practice common when smuggling is the misdeclaration of smuggled mercury. Miners who were interviewed for the study reveal that in cases where smugglers are able to bribe actual border police, mercury may enter formal ports without issues through the misdeclaration of goods. Bribed police, in turn, will allow their shipments to enter the country. When asked if this kind of bribing also occurs with officials from the military, informants have said that they do not believe the military is involved with mercury smuggling due to the fact that they do not have any control of our borders, where most of the smuggling is conducted.

#### 4.1.2. Mercury Smuggled through Informal Ports

With the Philippines being an archipelago, the majority of coastal communities have become homes to unregulated and unmonitored informal ports. These ports have become vital entry-points for smuggled goods such as mercury.

Key informants report that mercury is often smuggled by fishing vessels from nearby countries, with the mercury being hidden under the fish. This is prevalent in fishing areas such as Saranggani Province, where fishing vessels bringing mercury would dock at informal ports. At times, these fishing vessels don't even have to dock at the ports – sealed mercury containers are sometimes thrown overboard near these coastal communities to be retrieved by mercury smugglers.

In an interview with both the Davao PENRO and the South Cotabato Provincial Environment Management Office (PEMO), it was revealed that a popular meeting point for mercury smugglers is Balut Island. Balut Island,<sup>7</sup> due to its proximity to neighboring countries, has been popular to smugglers and illegal migrants for decades – in fact, the Philippine government in the 1960s had fears regarding Muslim irredentism in Mindanao due to the influx of Malaysian and Indonesian Muslims who were migrating illegally to Southern Mindanao via entry-points such as Balut Island.<sup>xliv</sup> Islands such as Balut and the nearby



Figure 5: Map detailing Balut Island and Saranggani's Proximity to Maluku, Indonesia (Source: Footnote 10)

7 Abbas, D. (2000). Once upon a time: Saranggani island. Published by the Philippine Post. Retrieved from: <https://jamalashley.wordpress.com/2007/04/17/once-upon-a-time-saranggani-island/>



Tibanban Island have also been linked with the illegal smuggling of weapons.<sup>xlv</sup>

Mindanao is a predominantly Muslim island. In the area known as Autonomous Region in Muslim Mindanao (ARMM), about 91.7% of the total population is Muslim.<sup>xlvi</sup> Key informants from both the mining communities and the government report that Muslim groups such as the *Maranao* may also be responsible for some of the mercury smuggling in Mindanao.

The *Maranao*, perhaps unfairly, have traditionally been linked to business practices such as operating without permits or smuggling illegal goods.<sup>xlvii</sup> The *Maranao*'s

proximity and close relations with other Muslims from nearby countries (through Balut Island and other entry-points) has led to a strong smuggling relationship among the countries – as recently as 2017, 200 *Maranao* businessmen who were engaged in selling illegal DVDs were apprehended in General Santos City.<sup>xlviii</sup>

A number of miners and gold traders who were interviewed for the study have confirmed purchasing mercury from *Maranao* traders. During a field investigation, BAN Toxics was also able to confirm that mercury is being sold by *Maranao* traders. The trade practices employed in the mercury black market are discussed in detail in Section 4.2.



#### 4.1.3. Mercury from Secondary Sources

Although the majority of mercury sold in the country enter the country through formal and informal shipping ports, informants have identified other sources of mercury.

##### *Confiscated & Recycled Mercury*

Informants have verified that mercury may sometimes be sold by other miners or by uniformed authorities such as the police.

Miners who were interviewed noted that they were not aware of any police involvement in selling mercury but reported that the police are known to sell confiscated dynamite to miners. When asked about this, the Davao PENRO noted that they believe that the police may also be involved in selling smuggled mercury, but miners may not be aware of this because the police would prefer to sell mercury exclusively to known mercury traders who would buy large quantities of the chemical, rather than miners who would buy small amounts depending on their needs. The PENRO also believe that although no major incidences have been reported, the police's history of selling confiscated goods

only adds to the argument, citing a recent incident where the police in the province were raided by operatives from the National Bureau of Investigation (NBI) for reports of selling illegal goods such as dynamite.

Another source of mercury identified are miners who sell mercury to other miners. Due to the distance between most mining areas and markets, miners may at times purchase large quantities of mercury to use and to sell to other miners who may not have the time to leave their mining tunnels to buy mercury. With these miners, it is also common to recycle the mercury that they use and sell them once they're finished processing their ores. This is a popular practice in ASGM communities in the Philippines, because it significantly lessens the costs associated with using mercury in processing gold.

### Mercury from Accredited Mercury Importers

As discussed in Section 3.2, the use of mercury for manufacturing, pharmaceutical, or dental industries (among others) is allowed under the Chemical Control Order for Mercury. As such, entities involved in these industries can legally import mercury into the country provided that they are registered and accredited by the government.

In a discussion with the Provincial Environment and Natural Resources Office (PENRO) of Davao del Sur, it was revealed that a number of legal mercury importers may be selling their mercury illegally to buyers such as miners or other mercury traders. Hospitals and dental clinics, in particular, were pointed as a source of mercury for ASGM due to the fact that there is an abundance of mercury thermometers and that dental amalgam is manufactured by dentists in the country.

The illicit trade of mercury from these sources is possible due to the lack of mechanisms to monitor where mercury is sold by legal importers. Accredited importers in the country are only required to submit reports regarding their transactions and actual cross-checking is not conducted by the government.

Still, mercury sourced from legal traders only comprises a small portion of the mercury used illegally in the country. In our discussions with miners, none of them reported purchasing mercury from these legal importers. In fact, only government stakeholders and some mercury/gold traders reported having information regarding this, suggesting that only actual mercury traders may have dealings with legal importers.



## 4.2. Mercury Trading Practices

Once mercury enters the country, it is brought to mercury hubs in Mindanao such as Marawi City, Zamboanga City, and Cagayan de Oro City (among others) where the lack of mercury regulations allow for mercury to be traded freely.<sup>xlix</sup> This mercury is then brought to Tagum City, which serves as an important trading hub due to its proximity to major ASGM areas in regions XI and XIII of Mindanao. Tagum City not only serves as a trading hub for mercury – the city is also considered one of the biggest illegal gold buying hubs in the country, with strong connections to foreign black markets such as those in China and Hong Kong.<sup>l</sup>

In our interviews with key informants, Tagum City's status as a major trading hub was confirmed, with informants reporting that major mercury and gold traders will flock the

city to replenish their mercury supplies. When asked who the major mercury traders are in Tagum City, miners and the Davao PENRO say that one of the biggest mercury traders in Tagum City is a hardware store.

Although Tagum City remains the center of trade, other areas may have their own major mercury suppliers. In Davao City, mining and government stakeholders both identified another hardware store as a major re-seller of mercury. This is consistent with previous information gathered by BAN Toxics – most of the mercury is bought through hardware stores in the area. When the owners of the said hardware store were interviewed for this study, they admitted to shipping mercury straight from mainland China, but they have stopped smuggling mercury since

“ Currently, mercury prices range from around P7,000 (\$135) to P12,000 (\$230) per kilogram. In contrast, mercury prices in 1995 amount to just P500 (\$10) per kilogram. ”

the local customs office started using x-ray machines to inspect shipments. This is consistent with the information provided by the Davao PENRO, who said that a number of mercury smugglers stopped importing mercury due to the increase in bribes asked by customs officials.

For distribution, mercury is packaged into smaller amounts and sold per kilogram. Mercury is placed in plastic bags wrapped in paper and masking tape. This repackaged mercury is sold throughout the country, with some of them being reported to reach as far as Baguio City in Northern Luzon, where ASGM operations also occur.<sup>ii</sup> This mercury is known to be transported to other locations in the country via land and sea and concealed inside vehicle parts and compartments to hide them from potential inspections.

Once this mercury reaches local merchants, it is sold through a number of ways. For the majority of miners interviewed in this study, the biggest source of mercury are gold traders who also sell mercury to augment their incomes. Depending on their hold on operations (e.g., if they also finance operations) some gold traders may also threaten to stop financing miners who refuse to buy mercury from them. In places such as Southern Leyte, mercury is provided for free by gold buyers. The impacts of power relations on continued mercury use is further discussed in Chapter 5.

Other times, mercury can be accessed through establishments such as mining supply stores and gold smiths. These mining supply stores may at times sell other mining-related illegal goods such as cyanide. It is also reported that mercury is sold in private gold-buying

stations such as those in Tagum City. For most of these transactions, mercury is sold discreetly and only to those personally acquainted with the seller, to avoid run-ins with the law. During our field investigations, BAN Toxics had difficulty trying to purchase gold at these mining supply stores due in part to the fact that we aren't trusted mercury buyers. However, it was easier to purchase mercury the farther we were from urban centers and the nearer we were to mining areas, with establishments around the far-flung mining areas being more open to trading mercury publicly due to the lessened visibility of the authorities.

Currently, mercury prices range from around P7,000 (\$135) to P12,000 (\$230) per kilogram. In contrast, mercury prices in 1995 amount to just P500 (\$10) per kilogram. The ASGM Baseline and Gold Supply Chain Report<sup>iii</sup> published by BAN Toxics note that the average miner earns only around \$2 to \$3 per day. Despite this, mercury use persists in ASGM.

The jump in mercury prices is seen as a significant factor that further widens the economic gap between miners and financiers. Utilizing data from Table 3 (Section 3.1.), miners who may use 48 grams of mercury to produce a gram of gold may lose as much as P336 (around \$6) per gram of gold sold. A gram of gold costs P1,300 (\$25), which would lead to gross profits of around P1,000 (\$20). Although P1,000 pesos is more than triple the minimum wage rates in most rural provinces in the country, it is important to note that in mining communities interviewed for this study, financiers get an average of 40% share of the profits with miners sharing the remaining 60% equally. As such, for every gram of gold, the remaining P600 (\$12) will be shared equally among a group of 3 to 6 or more miners.

### 4.3. Stakeholder Map and Mercury Value Chain

Based on our fieldwork activities, a number of stakeholders involved in the illicit mercury trade have been identified and summarized (Table 5).

The identified stakeholder groups play important roles in shaping the mercury value chain not only in Mindanao, but in the country. As reiterated throughout the document, it is generally believed that the majority of our mercury enters the Philippines through Mindanao.

Based on the information gathered during the fieldwork activities, the study develops a general illustration of the mercury value chain in the country. The impacts of the current value chain are further discussed in Chapter 5.

Table 5: Mercury Stakeholder Map	
Stakeholder Group	Description
Foreign Exporters	Foreign exporters are the primary source of mercury in the country, either through legal or illegal means. As identified by desk research and our field interviews, the main sources of mercury for ASGM communities are <b>China, Indonesia, and Malaysia</b> .
Local Smugglers	Local smugglers refer to individuals/groups based in the Philippines who smuggle mercury into the country. This includes individuals who are licensed to import mercury (as outlined in Section 4.1.1.), Chinese/Filipino smugglers who import directly from China, <i>Maranao</i> businessmen who have ties with communities in Malaysia and Indonesia, and other small-time mercury importers who engage in importing and selling mercury but may not necessarily be associated with the aforementioned groups.
Mercury Traders	Mercury traders refer to individuals or groups that engage in selling mercury. Traders, at times, may also double as local smugglers. In discussions with ASGM stakeholders, it was revealed that the majority of mercury is acquired by miners through their financiers (the people who provide funding to continue ASGM operations) or gold traders who double as mercury traders. The majority of mercury in the Mindanao area is said to be sourced from major hardware stores.
Miners/Ball Mill Operators	Refer to the primary users of mercury. ASGM is the primary source of mercury pollution in the country. Under EO 79, the use of mercury in small-scale mining activities is banned.
Government Stakeholders	Government stakeholders are the primary implementers of regulation and control mechanisms for mercury. As discussed in Section 3.2., the primary responsibility for implementing environmental laws are devolved to local governments.  Government stakeholders may also be at times involved in the mercury trade, either as mercury traders or users (by virtue of owning their own ASGM operations), selling confiscated mercury (in the case of police who may be involved), or by accepting bribes from mercury smugglers (in the case of customs or border control officials). For most of the mining stakeholders interviewed, corruption at the local government is believed to persist due to the largely informal status of the ASGM sector.

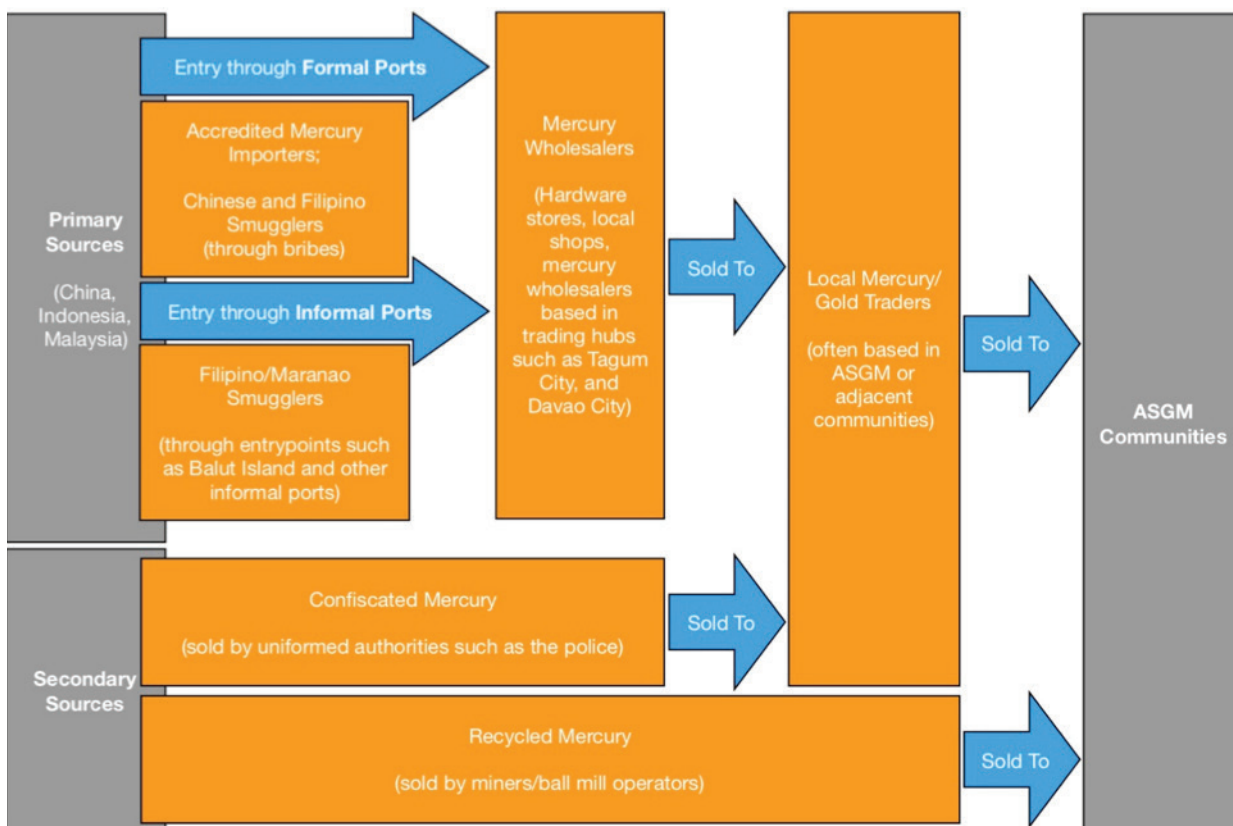


Figure 6: Mercury Value Chain in the Philippines

#### 4.4. Mercury Governance Practices

As discussed in Section 3.2., there are a number of policies that are designed to regulate the use of mercury in the country. The Chemical Control Order for Mercury (CCO) specifies the industries where mercury use is allowable. EO 79, in fact, prohibits the use of mercury in ASGM. However, the sector remains the biggest anthropogenic source of mercury emissions and releases in the country.

Governance practices impact the availability and accessibility of mercury in ASGM communities. Despite the fact that there are adequate policies in place that are designed to eliminate the use of mercury in ASGM, the use of the chemical persists. In discussions with mining and government stakeholders, it is apparent that mercury regulation practices are inconsistent across local government territories.

RA 7160, or the Local Government Code of 1991, devolves specific functions to local government units including the implementation of various environmental regulations.

As such, **governance practices are highly dependent on the priorities of local government stakeholders** in the context of environmental protection. Although local government units (municipal or *barangay* levels) are mandated to adhere to **national** and **provincial** laws, the implementation procedures and approaches of these policies are largely dependent on the local government unit.

Determining governance practices in regulating mercury and the ASGM sector as a whole was prioritized in desk research and discussions with the mining stakeholders. Table 6 outlines a number of experiences by ASGM communities:

Based on the findings, it can be concluded that the governance of mercury is highly contextual. Successful mercury-reduction initiatives are dependent on **ASGM being formalized** (with mercury elimination being a primary component of formalization) and/or a **strong community presence**.

**Table 6: Highlights in Mercury Governance and Perspectives**

Area	Notes
Brgy. Pinut-An, San Ricardo, Southern Leyte <sup>liii</sup>	<p>There are no current efforts to regulate the ASGM sector, and mercury use remains rampant. Informants reported that the local government unit largely ignores small-scale mining in the area paving the way for continued mercury use and other violations such as child labor.</p> <p>Miners who were interviewed for the report noted that, in recent memory, only once was there an inspection for child labor cases in the area. Ironically, this inspection was spearheaded by the provincial government, and not the local government unit.</p> <p>When asked regarding the perceived factors contributing to the LGU's lack of initiative in regulating ASGM, miners noted that factors such as 1) ASGM being small and relatively new in the community, 2) the lack of awareness regarding the social and environmental issues linked with ASGM, 3) the fact that most LGU officials may have been miners at one point and thus do not feel the need to formalize, and 4) extreme poverty in the area leading to decreased capacity for LGU-driven development.</p>
Camarines Norte <sup>liv</sup>	<p>Camarines Norte is one of the biggest gold-producing provinces in the Philippines, with significant mining operations in the towns of Labo, Paracale, and Jose Panganiban. As discussed in the BAN Toxics-published ASGM Baseline Report, governance of mercury and ASGM are largely dependent on the priorities of government officials.</p> <p>With mining being a primary source of livelihood in the province, a number of government officials were raised in mining backgrounds. In fact, some have even attested to playing with mercury as children in ASGM families. As such, governance of mercury is inconsistent – a number of government officials own their own ball mill processing facilities and may still use or sell mercury to other miners. At other times, mercury regulations may be in place but are not strictly implemented.</p> <p>Miners have noted that the lax implementation of these policies and their status as an informal sector allow government and uniformed officials to extort from miners by threatening them with arrests, as both the use of mercury and the conduct of ASGM activities are considered illegal in the province. The fact that a number of government officials may be benefitting from ASGM through corruption and extortion may be a significant factor leading to the reluctance of many government stakeholders to support the sector. In fact, the <b>ASGM Baseline Report for Camarines Norte and South Cotabato</b><sup>lv</sup> note that current small-scale mining activities were not incorporated in the provincial land use plans for the coming decade, despite ASGM being a primary livelihood for a number of municipalities in the province.</p>
Agusan del Sur & Tagum City	<p>In an interview with representatives from the National Coalition for Small-Scale Miners, there is a steady decline in mining operations that use mercury in the areas. It is generally believed that the decline in mercury use is due to key factors such as:</p> <ul style="list-style-type: none"> <li>• Government crackdown on mercury users and its subsequent impact on mercury prices on the market;</li> <li>• Concentrated effort from community organizations such as the National Coalition for Small-Scale Miners to eliminate mercury use in order to comply with the requirements for formalization, with most miners shifting to cyanide and carbon-in-pulp methods (both legal under law).</li> </ul> <p>The experience in Agusan del Sur and Tagum City both highlight the impacts of joint efforts between the government and community organizations.</p>
T'boli, South Cotabato	<p>T'boli in South Cotabato is home to the first fully-monitored and regulated mining areas in the country, through the establishment of Minahang Bayan areas. In the municipality, there is a strong community presence and an equally strong support from the local and provincial government units.</p> <p>The experience in T'boli is a primary example of how LGU priorities can shape governance practices. As ASGM is a priority for both the local and provincial governments, mercury regulations are more progressive in T'boli than in other communities. This is apparent in the enactment of municipal ordinances and regulatory policies such as the South Cotabato Provincial Environmental Code (which prohibits open-pit mining), and Municipal Executive Order No. 20, otherwise known as "An Executive Order Prohibiting the Use of Mercury in Gold Ore Processing in T'boli, South Cotabato."</p> <p>Mercury use within the Minahang Bayan areas is considered to be fully eliminated – regular inspections are conducted in mining tunnels and being caught with mercury will result in the closure of mining operations. Moreover, a number of current ball mill facility owners, in compliance with local ordinances, have shifted or have begun shifting to using cyanide. Cyanide, although toxic, is considered safer due to the fact that it does not bioaccumulate like mercury. Long-term goals for the municipality are to shift to safer technologies that do not use mercury or cyanide.</p> <p>Still, mercury use has not been completely eliminated in T'boli, South Cotabato. Ball mill processing facilities which are located outside of the Minahang Bayan areas and within residential compounds still use mercury, often in private, due to the fact that they are not monitored as often as mining tunnels.</p> <p>At the time of this writing, the LGU is considering a number of options to fully eliminate mercury use.</p>

“ The formalization of the sector and the imposition of regulation and monitoring mechanisms should be accompanied by development programs that strengthen linkages with formal markets, promote equitable wealth-sharing mechanisms, and support the transition to mercury-free technologies through investments in technology and knowledge-and capacity-building initiatives. ”

With the formalization of the ASGM communities in T'boli, mercury reduction efforts from the local government have been successful through supportive capacity-building programs. On the other hand, mining/mercury hotspots such as Tagum City and Agusan del Sur may not have government support that are on par with T'boli, but mercury reduction efforts have been successful due to the presence and initiatives of community organizations such as the National Coalition for Small-Scale Miners.

In other communities, the issue of mercury use have not been prioritized. This may be due to the perceived insignificance of its impacts due to a relatively small mining community, the lack of knowledge regarding mercury and the severity of its potential impacts, or the refusal of government stakeholders to prioritize mercury due to their involvement in gold mining. In some areas, barangay- and municipal-level government officials have been known to own ball-mill processing facilities and engage in gold trading. As such, local government officials may be wary of supporting mercury elimination efforts if it means a reduction in the revenue they can generate.

The issue of government biases in regulating mercury also extends to ASGM formalization as a whole. In areas where government officials have vested interests in large-scale mining, support for ASGM may be lacking and limited.

Government perspectives in regulating mercury also impact the success of these efforts. Miners often use mercury due to the lack of access to safer technologies, the need to produce gold quickly to sustain their subsistent lifestyles (with mercury usually only taking hours to process gold), and/or the fact that gold traders/financers who double as mercury traders to augment their incomes may sometimes refuse to allow miners to work if they refuse to use mercury.

Government stakeholders should consider these factors

when implementing mercury regulation mechanisms. Often, ignoring these issues lead to worsened conditions in mining. In Camarines Norte and Davao City, for example, the ban on mercury use has led to an increase in the prices of mercury (as discussed further in Chapter 5). However, the lack of support for miners who are looking to transition to safer technologies did not lead to the reduction of mercury use – miners are now still forced to use mercury albeit at higher prices due to their inability to produce gold without mercury. When asked regarding the impacts of increased mercury prices, miners noted that they only stopped using mercury at the gold panning stage<sup>8</sup> but instead only use it before smelting the gold.

The increase in mercury prices then did not lead to the significant reduction of use, but instead reduced the income-generation capacities of miners. This made it harder for miners to afford and access mercury-free technologies, for example.

The experience of communities such as T'boli in South Cotabato highlight the effectiveness of responding to key social, economic, and political issues in ASGM as a means to reduce mercury use in ASGM. As discussed in Section 5.2., mercury use is deeply embedded in the sector's culture and economy, and prohibitive policies may not be enough to eliminate its use in ASGM. The formalization of the sector and the imposition of regulation and monitoring mechanisms should be accompanied by development programs that **strengthen linkages with formal markets** (to reduce the instances of black market gold traders who are selling mercury as a means to augment their incomes), **promote equitable wealth-sharing mechanisms** (to allow miners to escape the need to produce gold with mercury on a daily basis to support their subsistent lifestyles), and **support the transition to mercury-free technologies** through investments in technology and knowledge-and capacity-building initiatives

8 Panning refers to the separation of soil or gravel from the gold ores by washing them in a pan with water. This is mostly employed by ASGM miners when extracting gold ores.

## 5. ANALYSIS OF RESULTS

### 5.1. Factors Contributing to Mercury Use

The use of mercury in artisanal and small-scale gold mining is perpetuated by a number of interconnected social, economic, and political factors. This section discusses these factors and how they relate to each other in four key categories.



#### 5.1.1. Cultural Factors

Mercury amalgamation is considered a traditional practice in ASGM. For most mining communities, mercury has become a staple of gold production for multiple generations of miners. The **decades-long use and ease of accessibility of mercury has, over time, shaped community perspectives with regards to the chemical.** In fact, a significant portion of miners recall playing with mercury bare-handed as children.

Nothing much has changed since then – adults and children alike are still unaware of the adverse impacts of mercury use. In a focus group discussion in T'boli, South Cotabato, mining stakeholders asked why mercury is banned when cyanide (whose impacts were perceived to be worse by miners) is legal. This is indicative of the lack of awareness in ASGM communities regarding the impacts of mercury.

With mercury use being deeply embedded in the small-scale mining culture, shifting perspectives has become a significant challenge. A significant portion of the population still believe that mercury is harmless. Those who are aware of the risks either ignore it since mercury-users have not had any significant health issues or are left with no choice but to continue using it due to the lack of alternatives.

Another factor contributing to these community perspectives on mercury is the fact that it is extremely difficult to link most health issues to mercury use. The bio-accumulative nature of mercury means that most health issues appear years after initial exposure. Moreover, as ASGM is poverty-driven and informally operating, most miners have limited access to health services, and mercury-related illnesses often go undiscovered and unreported.



### 5.1.2. Subsistence Mining and Mercury Use

The majority of small-scale miners in the Philippines are engaged in subsistence mining.<sup>ix</sup> As much as 75% of the total ASGM population barely earn enough for the day's needs, e.g., miners usually only earn enough to buy food, water, and other needs on any given day. On days where no gold is produced, miners and their families will be left with no money to purchase food. For most miners, they are left with no choice but to accrue significant debts to provide for their families.

The subsistent nature of mining contributes to continued mercury use in a number of ways. Firstly, mercury is accessible and considered a relatively quick and easy way to produce mercury. With mercury, miners are able to produce gold within hours. As the miners remain subsistent, there are limited opportunities for them to afford and access mercury-free technologies. In this sense, poverty contributes indirectly to the continued use of mercury in ASGM.

The rising prices for mercury have also contributed indirectly to perpetuating poverty in ASGM communities. As discussed earlier, mercury prices tend to sometimes double depending on how much it is regulated by LGUs. With poverty being a key contributing factor to the continued mercury use, the rising prices for mercury ironically may serve to prevent miners from further affording mercury-free technologies.

### 5.1.3. Industry and Market Factors

A number of industry and market factors also contribute to the continued use of mercury in ASGM. These issues are deeply rooted in the fact that most legal channels for selling gold are inaccessible for subsistent miners. In Camarines Norte, for example, a one-way trip to the nearest gold buying station (Naga City) will take around 5 hours to complete. Moreover, the tax rates imposed on gold mean that the potential income for miners will be lessened significantly. With this, miners are left with no other option than to sell gold to local gold buyers.

Local gold buyers make it easier for mine workers to sell their gold. Often, these buyers go to mining areas themselves to purchase gold straight from mine workers. These gold buyers usually buy gold at discounted rates – previous studies conducted by BAN Toxics reveal that, at times, gold is purchased from mine workers at as much as half the market prices. This further contributes to the poverty cycle experienced by mine workers, which (as alluded to in the previous section) is linked with continued mercury use.

The relationship between gold traders and mine workers also leads to a number of industry practices such as continued mercury use. In Camarines Norte, for example, gold buyers also double as the primary source of mercury for mine workers. Fearing that gold buyers will refuse to buy their products, most mine workers are then forced to use mercury. With the proliferation of gold and mercury trading in ASGM, it may be difficult for miners to find replacement gold buyers who would agree to buy their gold without selling them mercury first.

At times, the financiers themselves may enter into agreements with miners where gold will be sold for cheaper prices in exchange for mercury. This practice is especially commonplace in areas where financiers also double as owners of ball mill processing facilities. In these arrangements, financiers save money by buying gold for cheaper prices, while also benefitting by virtue of their ownership of the processing facilities. In areas such as Southern Leyte,<sup>ix</sup> gold buyers even provide mercury to mine workers for free in exchange for cheaper gold selling prices.

In an interview with ball mill operators in T'boli, it was revealed that the reduced gold-selling prices impacts the income of financiers significantly. Gold is known to be bought for P1,300 (\$25) per gram from miners and sold at almost double the price (P2,300 or \$45) in Tagum City.

With the illicit gold and mercury trade being closely linked, it is unsurprising that mercury stakeholders may exercise authority over miners and mining practices. This power dynamic between mercury traders and miners (centered on economic capacities) is a primary factor that contributes to continued mercury use.

Miners may find it difficult to stop using mercury due to the threat of severing their relationship with gold/mercury traders. And as mercury prices go higher and its trade persists, the economic and power divide between gold traders and miners are further widened.

For most of the illicit gold traders and mining financiers

in the country, mercury serves as a way to augment their incomes. As such, they may not always be willing to eliminate mercury use in ASGM. In discussions with government stakeholders, it is apparent that linkages with formal markets and accredited gold traders should be strengthened to allow miners to access more equitable wealth-sharing schemes and to access safer technologies.

Although mercury is banned under law, the lack of support for miners as well as the fact that the sector is poverty-driven prevent miners from accessing safer technologies. In some cases, the lack of consistency in governance practices has led to the boom of mercury trade hotspots (such as the rise of Balut Island as a primary trading area for smugglers). These mercury trade hotspots have become mercury hubs that are supplying ASGM communities in the whole country, even to areas that are islands apart.

The links between the illicit gold and mercury market and how it drives mercury use in ASGM is apparent. As such, strengthening ASGM's linkages with formal markets such as the Bangko Sentral ng Pilipinas and the imposition of more equitable wealth-sharing mechanisms may be priority needs for communities who want to eliminate mercury use. For this, a supportive governing environment is needed.

There is a lack of understanding of the factors that drive mercury use in the areas, and a lack of understanding of ASGM as a subsistent and poverty-driven sector. Most governance practices focus on prohibiting traditional ASGM processes – with the sector being mostly subsistent, miners would rather break the law (since they are considered illegal and informal to begin with) than to be left with no livelihood.



#### 5.1.4. Lack of Government Support

The ASGM sector remains largely informal, with the majority of mining communities in the country operating illegally.<sup>lxi</sup> As such, mine workers have little or no access to basic social services. Aside from the various risks present in mine sites, the informality of the sector also means that crimes against ASGM communities such as corruption and extortion occur regularly. This further contributes to the cycle of poverty that drives the sector.

The lack of support from the government also translates to the lack of opportunities for mine workers to access safer technologies. With ASGM remaining largely subsistent, mine workers will not be able to afford converting to mercury-free technologies without support from other stakeholders such as the government. With small-scale mining remaining informal and unrecognized, poverty and mercury use continue to thrive, and the government continues to lose billions of potential revenues at the local and national levels.<sup>lxii</sup>

The current realities faced by ASGM communities call for policies and programs that can support their transition to safer technologies and a formalized industry. Restrictive policies imposed on mercury, and to an extent, small-scale mining as a whole have not been fruitful. In 2012, Executive Order 79 (which imposes a ban on mercury use in small-scale mining) was implemented.<sup>lxiii</sup> In 2016, the Department of Environment and Natural Resources ordered all small-scale mining operations to cease operations.<sup>lxiv</sup> Despite these policies, small-scale mining and mercury use persisted – mine workers continued to operate due to the fact that small-scale mining remains the only accessible livelihood opportunity for most of them.

## 6. CONCLUSIONS AND RECOMMENDATIONS

### Formalization and Mercury Use

The factors contributing to continued mercury use are linked to ASGM's informality. As such, formalization serves as an important first step towards eliminating mercury use in ASGM. This provides a platform for the implementation of various projects.

In the long-term, national and local governments should pursue the legislation of policies that are supportive of the needs of the ASGM sector, and are responsive to pressing mercury-related issues. The ratification of the Minamata Convention should be prioritized, as this can pave the way for better mercury policies.

There are current moves to improve mercury regulations such as the on-going revision of the Chemical Control Order for Mercury in the Philippines. This is an important step towards controlling the entry of mercury into the country and its use. However, the majority of mercury still enters the country illegally, with the ASGM sector being its primary destination. This should be countered by strengthening border control policies (including educating border police on the risks of mercury use and the various modus operandi employed by smugglers) and encouraging the shift to mercury-free technologies.

It is recommended that mining-related policies such as RA 7076 and EO 79 be reviewed, and revised in accordance to the support that the ASGM sector needs. The experience of various mining communities detailed in this report reveal that prohibitive policies alone cannot reduce mercury use. Proper support from the government, including the provision of mercury-free technology, the support for formalization, and the strengthening of linkages with formal markets responds to the root causes of mercury use and may potentially be the driving factors that can eliminate its use in ASGM.

In the context of promoting mercury-free practices, LGUs are recommended to explore the possibility of 1) financing publicly-operated mercury-free facilities (as mandated by RA 7076), 2) accreditation of existing ball mill facilities who are using mercury-free technologies, including those using cyanide and carbon, with contractual agreements to eventually shift to non-toxic methods within a given timeframe, 3) partner with private investors in setting up processing facilities, or 4) explore partnerships with existing technologies such as the University of the Philippines – Department of Science and Technology (UP-DOST) mercury-free processing facilities.

Local and national government stakeholders are also urged to strengthen formal markets by 1) establishing gold buying stations in mining communities 2) and/or the accreditation of private gold traders in accordance to RA 7076. Currently, there are only 5 official gold buying stations in the country, despite AGM being present in around 40 provinces. Furthermore, LGUs are encouraged to explore options where they can consolidate the gold their mining communities produce in the absence of gold buying stations in their communities, with the eventual sale of the consolidated produce to the Bangko Sentral ng Pilipinas in mind.

With these long-term goals, it is also imperative that stakeholders implement projects that can immediately respond to current issues. Awareness-raising and capacity building initiatives focusing on the impacts of mercury use on communities should be prioritized. Crackdowns should focus on mercury traders rather than miners to discourage mercury trade. This is in response to the findings of the study which reveal that miners themselves do not have the capacity to stop using mercury due to market and industry factors.

In support of ASGM sectors, it is imperative that production of gold without mercury is incentivized. This should be possible through 1) the provision of mercury-free facilities for miners and/or the accreditation of existing mercury-free facilities, and 2) the implementation of monitoring and certification mechanisms that respond to key social and economic issues faced by ASGM sectors.

At the national level, LGUs should be mandated to focus on eliminating mercury. As reiterated throughout the study, mercury regulation and monitoring practices are highly dependent on LGU priorities. As such, a national mandate and plan for the elimination of mercury trade and use should be developed in accordance to national policies and in cooperation with relevant government agencies with the focus being capacitating LGUs in the context of eliminating mercury use.

A potential starting point for increased collaboration between LGUs and relevant agencies is to jumpstart partnerships and joint programs between municipal LGUs and the Department of Environment and Natural Resources via its Mines and Geosciences Bureau.

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