United Nations Environmental Programme

Enforcing the ban on the use of mercury in mining

Research Report

Leiden Model United Nations 2021

Forum: *United Nations Environmental Programme (UNEP)*

Issue: *Enforcing the ban on the use of mercury in mining*

Position: *President*

Personal Introduction

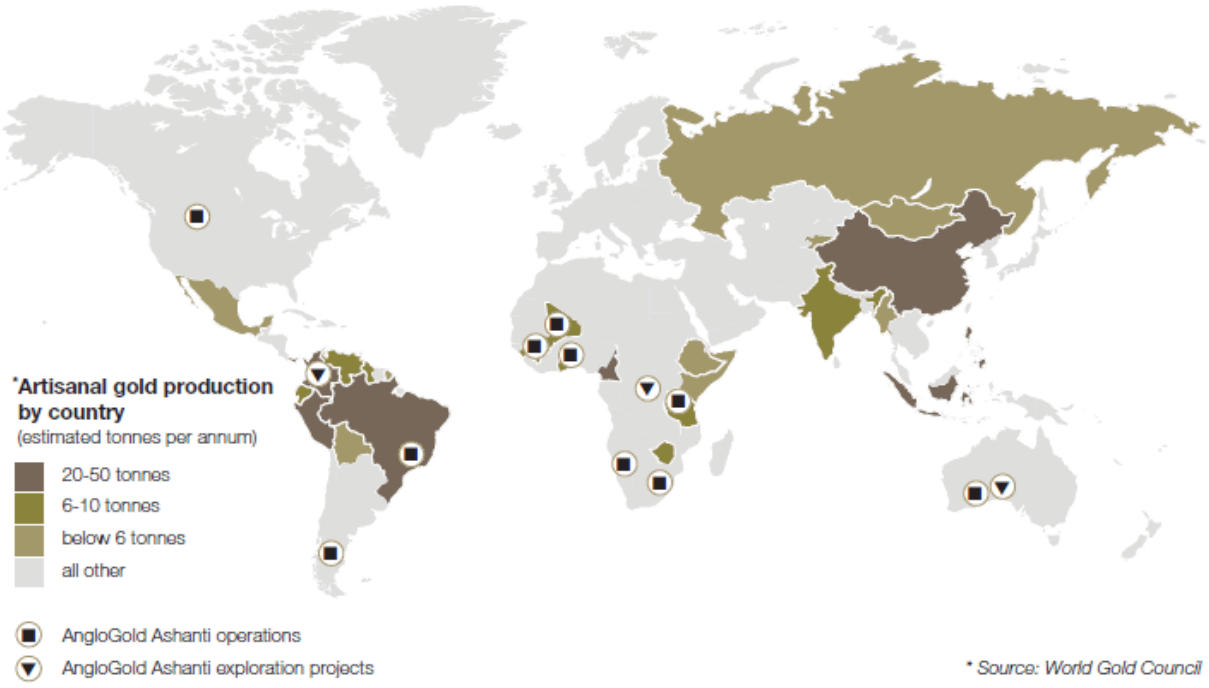
Greetings everyone, my name is Srilakshmi Chidambaram. I'm a 19 year old university student currently wrapping up my pre-medical degree in psychology and clinical sciences with a concentration in statistics. I grew up in the United Kingdom and currently study in Manila in the Philippines. I started MUN in 8th grade and have since participated in many conferences at the regional and international level. I have a soft spot for scientific committees with technical agendas, and it is hence an honour of mine to preside over the United Nations Environment Programme in Leiden Model United Nations 2021.

Introduction to the Topic

Mercury is very damaging to both human health and the environment. Inhalation of vapours can cause neurological and behavioral issues. Chronic exposure can lead to death. When released into the environment, mercury leaches into soil and freshwater resources, entering food chains and disrupting local ecosystems. Unfortunately, mercury is widely used in the extraction of gold in small-scale and artisanal mines across the world. This puts miners, local populations and indigenous communities at risk. For most part, they are unaware of the dangers and side effects of the mercury aided mining process. Globally, especially in Latin America, Africa and parts of Southeast Asia, millions of people are dependent on small-scale gold mines for their income and livelihood. In light of the damaging consequences of mercury pollution, the Minamata Convention came into effect in 2017. The Convention bans the use of new mercury mines, demands the phasing out of current mines and the use of

mercury in industrial processes such as gold mining. Our committee must focus on enforcing these regulations and prevent further damage from being done.

ASM world map



General Overview

The Use of Mercury in Gold Mining

Gold is an immensely valuable precious metal, but one that is difficult to extract and isolate. One of the easiest methods is through the use of mercury. In the industrial process, mercury is combined with materials containing trace elements of gold. This creates a mercury-gold amalgam, which is further heated to high temperatures. This vaporizes mercury and isolates elemental gold which is not 100% pure, but free from most impurities. [1]

The extraction of gold with the use of mercury is an ancient process. Evidence of its use dates back almost 3000 years ago. The industrial process was prominent in the United States up until the 1960s, the environmental impacts of which are still felt in northern California. [1]

Statement of the Problem

The inherent problem with this method is the release of mercury fumes into the environment. Vapours still inevitably escape into the atmosphere, despite the use of emission capture equipment. Mercury can also leach into soil and water sources, contaminating ecosystems and causing extensive damage to living organisms.

Mercury vapours have various negative effects on an individual's health. It primarily impacts the lungs and kidneys, nervous, digestive and immune systems. [3] With enough exposure, it can be lethal. [1] Mercury can be imbibed into the body through inhalation, ingestion or even physical contact. Common neurological symptoms include tremors, sleep problems, memory loss, headaches and loss of motor skills. [3] Exposure may also result in birth defects and miscarriages. Mercury is especially dangerous for women who are pregnant or of childbearing age. [2] According to the WHO, it is one of the top ten chemicals considered a major public health concern. [3]

UN Environment's new report *Global Mercury Supply, Trade and Demand* confirms artisanal and small-scale gold mining as the world's largest source of mercury emissions followed by coal fire, primarily in Africa, Asian and Latin America. Major mercury use continues to be in the extraction of gold and the production of vinyl chloride monomers. Artisanal and small-scale gold produces 12 to 15% of the world's gold and employs around 15 million people, often in remote rural areas, including 4 to 5 million women and children. To meet the growing demand for gold, new mercury supply chains have emerged since 2011 in Mexico and Indonesia, with their combined mercury mining production estimated at 800-1100 tonnes in 2015.

Unfortunately, most artisanal and small-scale miners do not have adequate knowledge of the adverse consequences of mercury on human health. Though cleaner and safer practices exist, small-scale miners lack the necessary funds and incentives to adopt safe mining practices.

The Minamata Convention

The Minamata Convention contains provisions that relate to the entire life cycle of mercury, including controls and reductions across a range of products, processes and

industries where mercury is used, released or emitted. It also addresses primary mining of mercury, its export and import, its safe storage and its disposal once it is waste. [5]

Under the Convention, countries are to:

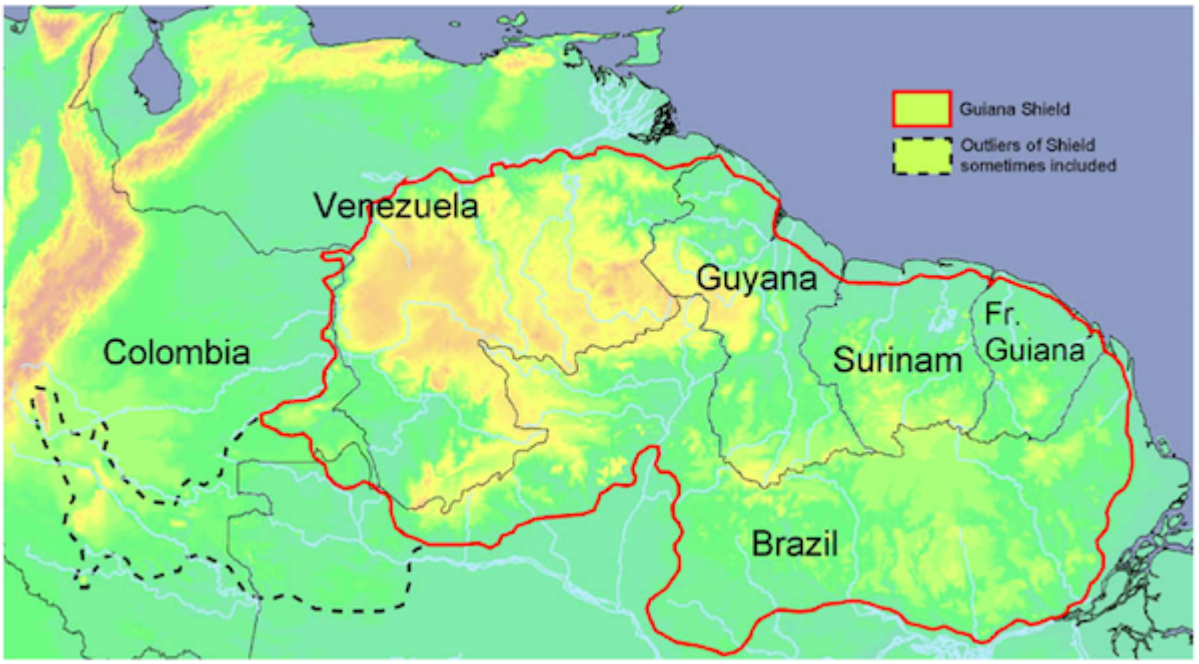
- Control mercury emissions from key industries (including coal, waste incineration, non-ferrous metals, and cement production)
- Ban new mercury mining and close existing mercury mines after a period of time
- Control trade in mercury
- ***Work to reduce the use of mercury in artisanal and small scale gold mining - the largest source of mercury pollution***
- Promote international cooperation on mercury monitoring and innovation

Major Parties Involved

The Guiana Shield

Small-scale gold mining has caused serious ecological problems in the Guiana Shield region (Guyana, Suriname and French Guinea) [1] due to irresponsible use of mercury and poor production techniques. The Guyanese government is aware of these environmental problems but does not seem to have the required capabilities to control them. [6, 7]

This is mostly due to the fact that small-scale mining sites are numerous, mobile and difficult to reach. Miners in these regions are not concerned about environmental damages and care only about economic gains. More stringent and serious policy regulations have to be developed for these destructive actions to be curtailed. [6, 7]



Indonesia and the Philippines

Indonesia produces close to $70 billion worth of gold a year, but only a fraction of that goes towards helping the impoverished local population. This leads to the launch of various illegal gold mining operations, which are dangerous and unstable.

A recent exploratory study conducted in Kalimantan surveyed several key stakeholders. These included government authorities, mining companies, mining associations and illegal miners. The findings found that illegal gold mining in Indonesia is a complex activity with a wide range of actors involved. Politicians, government officials and law enforcement agencies add to the complexity of the structure. The six main determinants of persistent illegal gold mining were determined to be financial issues, low entry barriers, a lack of regulation and policy, availability of supporting resources, political power and psychosocial factors.

Native Filipinos have been panning for gold for centuries. Industrial mining became commonplace after 1521, and is still prevalent in many parts of the Philippines. Mining has irreversible consequences on the local environment, examples of which include pollution of rivers and dumping of mining wastes in areas like Palawan. Republic Act 7942, also known as the Philippine Mining Act of 1995, was created

specifically to govern the exploration, development, utilization and processing of all mineral resources in the Philippines. Chapter XI Section 63 states that all contractors and permits shall strictly comply with sanitary operations, mine safety rules and regulations. Despite these measures, scores of illegal gold mines continue to operate across the country.

West Africa

Illegal gold mining has been occurring within West Africa for decades, predominantly in countries such as Mali, Ghana and Burkina Faso. Aside from being dangerous, environmentally damaging and injurious to health, it is also responsible for many violent crimes in areas such as the Zamfara State.

The head of the ICPC says there are clear links between economic crimes and the crisis in the region. He says the illegal exploitation of natural resources ends up financing arms, promoting organised crime, aiding drug trade, state capture, terrorism and kidnap for ransom.

Timeline of Key Events

2013 - Governments agree to the Minamata Convention on Mercury. It obliges government signatories to take a range of actions to address mercury emissions and related pollution.

2017 - The parties to the Minamata Convention on Mercury enters into force on the 16th of August. It contains legislation banning the construction of new mercury mines, phasing out existing production lines and regulations on the use of mercury in artisanal and small-scale gold mining.

Possible Solutions

Alternatives to Mercury Usage in Mining

- Gold is a heavy metal, so alternative isolation methods involve the motion of water to help separate the gold from lighter particles. [1]

- Panning is the process by which sediments containing trace gold are sifted in a curved pan with water to isolate gold particles from other impurities. It is more labour intensive than using mercury, but much safer, with no possibilities of side effects. [1]
- Sluicing involves sending sediment through a water platform to capture heavier gold particles. [1]
- Apart from the aforementioned gravity concentration methods, other options can also be employed such as shaking tables, spiral concentrators, vortex concentrators and centrifugation. [4]
- More complex processes involve magnetic separation, flotation, chemical leaching and smelting. [1]
- Implementation of education programmes in mining communities with organized training and capacity building workshops, detailing the health implications of mercury and promotion of responsible use. [2]
- Usage of mercury retorts - small devices designed to burn amalgam safely without releasing mercury vapours into the air, reducing air pollution and harmful exposure. [2]

Eliminating mercury mining, its use in gold extraction and other industrial processes.

Reworking national legislation to prioritize the health and safety of miners and prevent the hazardous use of mercury in commercial mining operations.

Incentivizing markets to value gold extracted without the use of mercury at higher prices, revitalizing the concept of 'green gold'.

Bibliography

[1] Business, Philippe Dozolme Phillippe Dozolme wrote about mining for The Balance Small, et al. "Find out Why Using Mercury in Gold Mining Is a Problem." *ThoughtCo*, www.thoughtco.com/gold-mining-mercury-usage-2367340.

[2] "Promoting Responsible Use of Mercury in Mining." *Solidaridad Network*, www.solidaridadnetwork.org/story/promoting-responsible-use-of-mercury-in-mining/.

[3] World Health Organization. “Mercury and Health.” *who.int*, World Health Organization: WHO, 31 Mar. 2017, www.who.int/news-room/fact-sheets/detail/mercury-and-health.

[4] TEPE. “Alternatives to Mercury Use in Small-Scale Gold Mining.” *Mining Zimbabwe*, 30 Dec. 2020, miningzimbabwe.com/alternatives-to-mercury-use-in-small-scale-gold-mining/. Accessed 4 Nov. 2021.

[5] “Homepage | Minamata Convention on Mercury.” *www.mercuryconvention.org*, www.mercuryconvention.org/en. Accessed 4 Nov. 2021.

[6] “Gold Mining Expanding Rapidly along Guiana Shield, Threatening Forests, Water, Wildlife.” *Mongabay Environmental News*, 22 Oct. 2014, news.mongabay.com/2014/10/gold-mining-expanding-rapidly-along-guiana-shield-threatening-forests-water-wildlife/. Accessed 4 Nov. 2021.

[7] ROOPNARINE, LOMARSH. “SMALL-SCALE GOLD MINING and ENVIRONMENTAL POLICY CHALLENGES in GUYANA: PROTECTION or POLLUTION.” *Canadian Journal of Latin American and Caribbean Studies / Revue Canadienne Des Études Latino-Américaines et Caraïbes*, vol. 31, no. 61, 2006, pp. 115–143, www.jstor.org/stable/41800294. Accessed 4 Nov. 2021.