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Mercury, small-scale gold mining and human rights

Report of the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes, Marcos Orellana

Summary

Pursuant to Human Rights Council resolution 45/17, the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes, Marcos Orellana, presents to the Council his annual thematic report, which is dedicated to the harms and risks for human rights of the use of mercury in small-scale gold mining. Mercury is a persistent heavy metal, hazardous to human health and the environment, whose release from mining activities is contaminating lands, rivers and oceans on a global scale and harming human health. Small-scale gold mining is the world's largest emitter of mercury into the environment. Yet, international arrangements for the control of mercury in small-scale gold mining have gaps and shortcomings. The Special Rapporteur examines the human rights violations and environmental injustices, including the structural racism suffered by indigenous peoples, that result from mercury use in small-scale gold mining.

I. Introduction

1. Millions of men, women and children around the world are engaged in artisanal and small-scale gold mining (henceforth referred to as "small-scale gold mining"). For most, it provides a subsistence livelihood based on hard labour in difficult conditions with many hazards. They use hand tools, panning, sluices, floating dredges and rudimentary mining equipment to extract tiny fragments of gold from low-grade ore. Those supported by small investors may have excavators. Their activities are destroying vast areas of jungle, forests and riverbanks, leaving wastelands of tailings and mining pits.

2. The most devastating aspect of this mining, for the workers and for the global community, is the use of mercury to extract the gold from the ore. Elemental mercury is a highly toxic, persistent liquid metal, a neurotoxin that forms dangerous vapours at room temperature and when heated to burn off the mercury to purify the gold. The mercury enters the atmosphere, washes from mine tailings into rivers, lakes and oceans and converts to bioavailable, highly toxic methylmercury, contaminating fish and other aquatic life, building to dangerous levels in the food chain and contaminating those who eat the fish.[1]

3. The inhalation of elemental mercury vapours and consumption of methylmercury in fish can cause neurological and behavioural disorders, such as tremors, emotional instability, insomnia, memory loss, neuromuscular changes, and lung, cardiovascular and reproductive defects. Methylmercury can pass through the placenta, increasing fetal risk of neurodevelopmental disorders, physical defects and reduced IQ. Mercury exposure can also harm the kidneys and thyroid and impair vision, speech, hearing and gait.

4. This was the fate of thousands of adults and children in Minamata, Japan, in the 1950s, when industrial effluent containing high concentrations of methylmercury poisoned the fish of Minamata Bay, which provided the main livelihood for Minamata's fisherfolk.[2] In total, 50,000 people were affected and 2,000 were diagnosed with Minamata disease, severe mercury poisoning that causes neurological issues and can lead to paralysis, coma and death.

5. The devastation of Minamata disease caused global concern about mercury pollution, which eventually prompted the negotiation of the Minamata Convention on Mercury, the namesake of the tragedy in Japan. The treaty's objective is to protect human health and the environment from anthropogenic emissions of mercury and releases of mercury and mercury compounds.

6. The Minamata Convention is a strong instrument that comprehensively addresses mercury. In respect of small-scale gold mining, however, it exhibits design and implementation weaknesses. Instead of banning global trade in mercury and prohibiting its use in such mining, the Convention pinned its hopes on mining formalization, allowing these practices to continue. At the time of adoption of the treaty, the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes and the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment expressed strong concern that the Convention had no end-date for the phase-out of mercury in that sector, and that trade in mercury was allowed within the regulations.[3]

7. The concerns of human rights experts about the Convention's shortcomings were well founded. The contribution of mercury releases and emissions of mercury from the small-scale gold mining sector has continued to grow,[4] with grave consequences for millions of miners, vulnerable women and children, indigenous peoples, ecosystems and aquatic life. There is a growing flow of mercury into the rainforests of the Amazon basin, the villages and rivers of

[1] Louisa J. Esdaile and Justin Chalker, "The mercury problem in artisanal and small-scale gold mining", *Chemistry: A European Journal*, vol. 24, No. 27 (11 May 2018).

[2] World Health Organization (WHO), "Mercury and health", 31 March 2017.

[3] Office of the United Nations High Commissioner for Human Rights (OHCHR), "Minamata Convention on Mercury: UN experts call for a full global response to a global scourge", 11 October 2013.

[4] United Nations Environment Programme (UNEP), *Global Mercury Assessment 2018* (Geneva, 2018).

Indonesia, the gold mining towns along the banks of Lake Victoria in Kenya, Uganda and the United Republic of Tanzania, and many other locations.

8. Demand for mercury supply, both legal and illegal, surges in lockstep with the price of gold. It is the insatiable demand for gold in the financial and jewellery markets of the wealthiest countries that now drives mercury trade. It is the gold market's ambition to exploit new deposits that sees thousands of miners invading indigenous lands, corroding indigenous culture and laying waste to protected environments.

9. The present report is informed by a broad consultative process in which the Special Rapporteur invited input from States, international organizations, civil society, national human rights institutions, academia and other key stakeholders. He widely disseminated a questionnaire and call for input, and a number of highly informative submissions were received.[5] The Special Rapporteur also held two online consultation meetings, on 9 and 16 March 2022, with the participation of experts representing civil society organizations from around the world, and academics.

10. The Special Rapporteur expresses his gratitude to those who shared their expertise, insights and perspectives, both in written contributions and during the online meetings.

II. Small-scale gold mining

11. The use of mercury for gold extraction is the main source of mercury pollution across the globe. It accounts for 37 per cent of all mercury emissions (838 tons in 2015),[6] dwarfing stationary combustion of coal (21 per cent), non-ferrous metal production (15 per cent) and cement production (11 per cent).[7] Additionally, approximately 1,220 tons of mercury were released into land and aquatic environments in 2015 from small-scale gold mining alone.[8] The epicentres of these releases are South America (53 per cent), East and South-East Asia (36 per cent) and sub-Saharan Africa (8 per cent). The total emissions and releases from small-scale gold mining globally are estimated at approximately 2,058 tons per annum.

12. While the Minamata Convention addresses anthropogenic mercury pollution by regulating trade in mercury, phasing out mercury-related products and processes and reducing industrial mercury emissions, it still allows the trade and use of mercury in small-scale gold mining.

A. Economic dimensions

13. An estimated 10 million to 15 million people were directly engaged in small-scale gold mining in 2017, including an estimated 1 million child workers and 4.5 million women.[9] It generates up to 20 per cent of global gold supply annually, equivalent to approximately 500 tons, with a market value of almost $29 billion annually.

14. Some argue that banning mercury use in small-scale gold mining, via the Minamata Convention or other means, would impair the livelihoods of the millions of people who have no immediate alternative livelihood. This argument can be described as "woke-washing": it appears to advocate policies to favour the poor while maintaining a status quo that harms them. All the while, the downstream gold industry profits.

15. The actual harm caused by small-scale gold mining to human rights and the environment of countless individuals, communities, peoples and ecosystems cannot be justified by the economic gains of the mining industry or the poverty of miners. Everyone

[5] Available at https://www.ohchr.org/en/calls-for-input/calls-input/call-submissions-mercury-artisanal-and-small-scale-gold-mining-and.

[6] Under article 8 of the Minamata Convention, "emissions" means emissions of mercury or mercury compounds to the atmosphere.

[7] UNEP, *Global Mercury Assessment 2018*.

[8] Under article 9 of the Minamata Convention, "releases" means releases of mercury or mercury compounds to land or water.

[9] UNEP, *Global Mercury Supply, Trade and Demand* (Geneva, 2017).

has the right to an adequate standard of living, but no one has the right to harm the health or physical integrity of others to earn a living. The harm caused by mercury is amplified by its persistence, leading to the proliferation of contaminated sites and accumulated mercury pollution in the food chain that will negatively affect the rights of future generations.[10]

B. Techniques

16. The two main forms of small-scale gold mining are alluvial mining, in which free gold is recovered from water sources through panning or dredging of rivers and streams, and hard-rock mining, in which underground rocks are uncovered and crushed to recover gold. Mercury is regularly used in both forms.

17. There is a diverse range of low-technology ore-processing methods for obtaining gold from ore in small-scale gold mining. While non-mercury technologies are available, mercury is easy to use, inexpensive and readily accessible owing to extensive legal and illegal trade networks. However, in nearly all cases, non-mercury concentration and extraction methods yield more gold from the same ore than mercury amalgamation.

18. When miners have finished their amalgamation process, they take the resulting "sponge gold" – gold with residual mercury – to a gold shop. There, the gold sponge is heated with a blowtorch to remove the remaining mercury and obtain a true weight for the gold. While fume hoods are sometimes installed to capture some of the mercury emissions, and mercury capture systems can be installed to effectively control most of the emissions, generally the workers, their customers and surrounding communities are subject to very high levels of gaseous elemental mercury. The gold shops are often located in densely populated urban areas.[11]

C. Downstream interests

19. The downstream gold supply chain drives small-scale gold mining and indirectly pushes the mercury trade that facilitates gold extraction. Small-scale gold mining supplies approximately 20 per cent of total gold production annually. However, in contrast to large-scale industrial gold mining, traceability of gold production and fate is virtually non-existent. While some attempts have been made to create traceable "green gold", whereby gold production is certified as environmentally sound,[12] the majority of small-scale gold mining gold remains outside of such schemes.

20. Small-scale mined gold may enter the global supply chain after being sold to legal dealers, directly acquired by government banks in the country where it is mined, or smuggled from the country illegally. Nonetheless, industrial gold mining operations often buy the small-scale mined gold after supplying mercury to the miners.

21. Most small-scale mined gold, even after some purification at gold shops, is still considered to be doré, which requires further refining to meet international standards. Once refined, banks and traders on the bullion market purchase the gold and airfreight it to secure vaults across the world. These are mostly central banks and gold-backed exchange traded funds that allow investors to speculate on gold prices.

22. Both legally and illegally sourced gold can enter this supply chain. Well before refining, all traceability is lost. This is an advantage for organized crime and corrupt officials seeking to profit from the gold trade.

23. Switzerland and the United Kingdom of Great Britain and Northern Ireland are currently the largest gold importers globally, with their refineries driving demand from small-scale gold mining and industrial gold production. In 2020, Switzerland imported gold valued

[10] Submission by the International Indian Treaty Council.

[11] Keegan H. Moody and others, "Mercury emissions from Peruvian gold shops: potential ramifications for Minamata compliance in artisanal and small-scale gold mining communities", *Environmental Research*, vol. 182, March 2020.

[12] See https://fairmined.org/.

at $87.9 billion, just behind the United Kingdom at $88.3 billion.[13] While some refiners are engaged in trying to move miners away from mercury use through training and formalization (supported by donor nations), organized crime actors are also manipulating the formalization process to launder gold extracted illegally with mercury.[14]

D. Mercury trade for small-scale gold mining

24. The Minamata Convention does not prohibit international trade in mercury, despite phasing out most products and processes that require mercury. The Convention regards small-scale gold mining as an allowed use of mercury, and therefore trade in mercury destined for such mining remains legal. Still, the Convention subjects any legal trade to its prior informed consent provisions, through which parties can compare the amount proposed for import with their reduction targets and refuse to give consent. Also, the Convention does not allow mercury from primary mercury mining or excess mercury from older, decommissioned chlor-alkali facilities to be used in small-scale gold mining.[15]

25. Both the European Union and the United States of America have banned the export of all mercury. Other countries have banned the use of mercury in small-scale gold mining but still allow mercury imports for lighting products, dental amalgam, laboratory uses and other uses. Even in countries where mercury is banned for use in small-scale gold mining, such as Cameroon, Colombia, Kenya and Mongolia, it can still be obtained relatively easily through smuggling.[16]

26. Official records of total volumes of mercury legally traded internationally show a decline in recent years, while illicit mercury trade is widespread and increasing.[17] In 2017, in the most recent compilation of official trade data, the United Nations Environment Programme (UNEP) assessed mercury trade flows to 2015: global supply was estimated at 4,100 tons, with 46 per cent produced through primary mercury mining (including informal mines in Indonesia and Mexico, 30 per cent from recycled products and wastes, 15 per cent from by-product of non-ferrous metal mining, and 10 per cent from closing or converting chlor-alkali facilities.[18]

27. The global demand for mercury was led by small-scale gold mining at 37 per cent, followed by vinyl chloride monomer production at 26 per cent, mercury-added products such as lighting and batteries at 24 per cent, chlor-alkali facilities at 6 per cent, and a range of other minor uses such as paint, pesticides and measuring equipment at 7 per cent.[19]

1. Countries involved in mercury trade

28. The high demand for mercury use in small-scale gold mining is from three key regions: South America (39 per cent), East and South-East Asia (37 per cent) and sub-Saharan Africa (21 per cent). However, determining who is exporting mercury to these regions is complex. Official data includes transit countries, which complicates and obscures the origin of the shipments. Before the European Union and the United States banned mercury exports in 2011 and 2013 respectively, both were major mercury exporters and shipping hubs that stockpiled mercury for sale. Following the export bans, the dominant exporters became China, Indonesia and Mexico, but free-trade transit zones – such as India,

[13] See https://www.statista.com/statistics/1247543/switzerland-gold-import-value/.

[14] Submission by Derecho Ambiente y Recursos Naturales.

[15] Convention, arts. 3 (4) and 3 (5) (b).

[16] Submission by Asociación Interamericana para la Defensa del Ambiente; International Criminal Police Organization (INTERPOL), *Illegal Gold Mining in Central Africa: Analytical Report* (Lyon, 2021); and Katie Jones, "Dirty business – the smuggling pipeline carrying mercury across the Amazon", InSight Crime, 13 May 2021.

[17] See the Bali Declaration on combating global illegal trade of mercury, Conference of the Parties to the Minamata Convention on Mercury at its fourth meeting, March 2022.

[18] UNEP, *Global Mercury Supply*.

[19] Ibid.

Panama, Singapore, the United Arab Emirates and Hong Kong, China – also featured prominently in trade data.[20]

29. Researchers at Chatham House developed a preliminary analysis of official mercury trade statistics for 2020.[21] Key findings show that the biggest importers of mercury were Bolivia (Plurinational State of), China, India, the Russian Federation and the United Arab Emirates. However, over 60 per cent of the imports to the Russian Federation were re-exported to the Plurinational State of Bolivia, the only importer in this group with widespread small-scale gold mining activity and reported as a centre for mercury smuggling into countries in the Amazon basin.[22] Since 2015, India, Indonesia, the Russian Federation, the United Arab Emirates and Viet Nam appear to have been major actors in re-exporting mercury and acting as trading hubs.[23] The United Arab Emirates consistently imported and exported significant quantities of mercury in the period 2015–2020. Tajikistan, a non-party to the Minamata Convention, exported 20 per cent of the mercury in the formal market – approximately 179 tons – in 2020.[24]

2. Diversion of mercury for small-scale gold mining

30. Importers of mercury often misrepresent its end uses. Import documents will declare mercury as destined for dental amalgam or other legal uses to enable imports to pass customs unnoticed. Customs officials are often bribed to ignore the mercury shipments.[25]

31. Virtually all States that responded to the call for input corroborated the claim that the destination and end use of mercury imports, where permitted, were not confirmed or audited. This is a clear regulatory gap that allows for diversion of mercury to small-scale gold mining.

3. Environmental crime, smuggling and corruption

32. Small-scale gold mining and the supply and trade in illegal gold and mercury are closely entwined.[26] Mercury is smuggled illegally into small-scale gold mining areas, while illegally produced gold is smuggled out. They often share the same shipment pathways, especially as narcotics cartels diversify and expand their smuggling routes to include gold and mercury.[27]

33. The international trade and supply of mercury has been falling significantly over the past 20 years. This is partly attributable to the regulations of the Minamata Convention, and even more to the export bans on mercury by the European Union and the United States. At the same time, the price of gold has been steadily rising, increasing demand for mercury for gold extraction. The combination of these scenarios makes smuggling mercury very lucrative. In addition, powerful or corrupt officials (customs, police and military), militia groups, organized crime actors and insurgents are either directly involved in mercury trading or facilitate its movement into small-scale gold mining areas in return for bribes.

34. In the early 2000s, a gold rush escalated in the Madre de Dios region in south-east Peru, attracting thousands of small-scale gold miners to the Amazonian rainforest, many using mercury.[28] By 2008, the situation generated severe social dislocation and the affected region "became a lawless Eldorado with major social problems, violence, criminality and

[20] Ibid.

[21] See https://resourcetrade.earth/?year=2020&category=1512&units=weight&autozoom=1.

[22] See communication BOL 3/2021, available at https://spcommreports.ohchr.org/TMResultsBase/DownLoadPublicCommunicationFile?gId=26680.

[23] See https://resourcetrade.earth/?year=2019&category=1512&units=weight&autozoom=1.

[24] Ibid.

[25] Submission by Avocats sans Frontières; National Committee of the Netherlands for the International Union for Conservation of Nature, "IUCN NL sheds light on the formal and informal mercury trade", 20 April 2020; Mark Staples, "ASGM and the illicit mercury trade", Mercury Science and Policy at MIT, 16 January 2013; and UNEP, *Summary of Supply, Trade and Demand Information on Mercury* (Geneva, 2006).

[26] Bali Declaration.

[27] Submission by Hutukara Associação Yanomami.

[28] Jacqueline R. Gerson and others, "Amazon forests capture high levels of atmospheric mercury pollution from artisanal gold mining", *Nature Communications*, No. 13, art. No. 559 (2022).

hardship".[29] In 2010, security forces took harsh action against miners, destroying equipment and confiscating gold.[30]

35. In 2011, the Government of Peru concluded that nearly all small-scale gold mining in Madre de Dios was illegal.[31] Prosecutors alleged that formal gold mining corporations laundered metal from illegal sources, such as mines financed by narcotics dealers or in banned sites in the Amazonian rainforest.[32] In 2016, the Government declared a state of emergency in Madre de Dios, due to mercury contamination. Indigenous peoples in the region report that little has changed since.[33]

36. Criminal operations found a willing international market for the gold, including major refineries in Italy, Switzerland and the United States that were unconcerned about its origins.[34]

III. Human rights impact

37. In most small-scale gold mining locations worldwide where mercury is used, the human rights of miners, their families and communities, and the indigenous people and traditional owners of the land are increasingly compromised by mercury contamination. Adverse social effects and human rights violations in these localities are rampant, with trafficking in persons, slavery, disease, crime and violence.[35] In Brazil alone, 333 people have been rescued from slavery conditions in small-scale gold mining over the past 13 years.[36]

38. These human rights violations and abuses from such unmanaged, informal and illegal mining activity also highlight States' failure to adhere to the Sustainable Development Goals to end poverty and hunger; to ensure healthy lives, clean water, decent work, sustainable consumption and inclusive access to sustainable development; and to protect and conserve lands and waters.[37]

A. Rights to life, health, food and a clean and healthy environment

39. Many people in small-scale gold mining locations lose their lives in accidents, mining collapses, violence over gold-dealing and violence by criminal gangs and paramilitaries controlling gold production. Many more have their physical integrity and health compromised by exposure to mercury and to mercury-contaminated food such as fish and rice.[38]

1. Deforestation, biodiversity loss and contaminated sites

40. Small-scale gold mining heavily disturbs and fragments local environments. Deforestation related to such activity has decimated forests and aggravated biodiversity loss,

[29] Society for Threatened Peoples, "Dealings in illegal gold: Swiss, US and Italian refineries under suspicion – summary" (Bern, 2016).

[30] Ibid.

[31] Ibid.

[32] Brenna Hughes Neghaiwi, Mitra Taj and Peter Hobson, "Special report: Sleeping Beauty – how suspect gold reached top brands", Reuters, 6 March 2020.

[33] Submission by the Ombudsman's Office, Perú.

[34] Society for Threatened Peoples, "Dealings in illegal gold".

[35] Dolores Cortés-McPherson, "Labor trafficking of men in the artisanal and small-scale gold mining camps of Madre de Dios: a reflection from the 'diaspora networks' perspective", in *The Palgrave International Handbook of Human Trafficking*, John Winterdyk and Jackie Jones, eds. (London, Palgrave Macmillan, 2020).

[36] See https://observatoriodamineracao.com.br/revealed-in-13-years-operations-have-rescued-333-workers-from-slavery-in-brazilian-mines/.

[37] Submission by the United Nations Development Programme; and Sustainable Development Goals 1–3, 8, 12 and 14.

[38] WHO, "Mercury exposure and health impacts among individuals in the artisanal and small-scale gold mining (ASGM) community", 31 January 2013. https://cwm.unitar.org/cwmplatformscms/site/assets/files/1290/mercury_asgm.pdf.

placing further stresses on species already in danger of extinction. Almost 100,000 hectares were cleared for small-scale gold mining in Peru between 1984 and 2017, and half of this deforestation occurred in the last 6 years of that time period.[39] Deforestation reduces the capacity of rainforests to remove mercury vapour from the air. This mercury can then cycle through the air as inorganic mercury, fall to the ground as rain and transform into methylmercury, which more easily enters the food chain.[40]

41. In some cases, deforestation encroaches on protected lands. In Indonesia, an audit found that 115 companies had conducted small-scale gold mining activities on over 471,000 hectares of productive and protected forests without a licence.[41] Clearing land for roads and other infrastructure also causes further deforestation as more miners gain access to forests to initiate mining activities.

42. Landscapes of abandoned deep pits fill with stagnant water, creating breeding grounds for mosquitoes, while rivers are contaminated with mercury and tailings. The scarring of the landscape is so severe in some locations, such as in La Pampa in the southern Peruvian Amazon, that the deforestation damage from small-scale gold mining can be seen in satellites imagery.[42] Much of the damage to rivers and forests in the Amazon basin has been described as irreversible and accelerating,[43] threatening to cause a "new Minamata", by reference to the Japanese city.[44]

43. In 2019, at the fourth meeting of the Conference of the Parties to the Minamata Convention, updated guidance on the management of contaminated sites was adopted, including on managing the risks of mercury in small-scale gold mining.[45] The guidance stresses the importance of community engagement and education, given the nature of settlements and contamination in and around these sites.[46]

2. Bioaccumulation and contamination of food sources

44. The process of bioaccumulation of mercury through trophic levels of certain species such as fish is well known. For much of history, global mercury pollution was largely limited to natural sources such as volcanic eruptions and erosion processes in areas of naturally occurring cinnabar ores. However, with the advent of industrialization and growing activity in small-scale gold mining, mercury pollution sources grew unabated, resulting in widespread contamination of the world's oceans, rivers and lakes.

45. Bacterial processes convert the metallic mercury in waterways into highly toxic and bioavailable methylmercury. In turn, aquatic organisms such as fish and shellfish ingest the mercury. As larger fish feed on smaller fish, the mercury body burden in higher trophic levels of aquatic organisms builds up through a process of biomagnification, resulting in dangerously high levels of mercury in the flesh of predatory fish at the top of the food web, such as shark, tuna, mackerel, swordfish and marlin.

46. Most countries that import ocean fish for consumption have developed fish advisories, as predatory fish have often exceeded the "safe" mercury threshold of 1 part per million, as set by the United States Environmental Protection Agency. They advise limiting weekly or monthly consumption of these species to keep ingested mercury below safe levels, especially for pregnant women.

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[39] Jorge Caballero Espejo and others, "Deforestation and forest degradation due to gold mining in the Peruvian Amazon: A 34-year perspective", *Remote Sensing*, vol. 10, No. 12 (December 2018).

[40] Maria Elena Crespo-Lopez and others, "Mercury: what can we learn from the Amazon?", *Environmental International*, vol. 146 (January 2021).

[41] Sumali Agrawal and others, *Impacts of Extractive Industry and Infrastructure on Forests: Indonesia* (San Francisco, Climate and Land Use Alliance, 2018).

[42] See https://mine.nridigital.com/mine_jun21/satellite_images_illegal_mining.

[43] See https://news.mongabay.com/2019/12/illegal-gold-rush-causing-irreversible-damage-to-rivers-in-the-brazilian-amazon/.

[44] Information gathered during consultations, regarding a forthcoming documentary entitled *The Amazon: a New Minamata?* (see http://oceanfilms.com.br/ing/film-detail/amazonia-nova-minamata/).

[45] Decision MC-3/6, UNEP/MC/COP.3/23, annex.

[46] UNEP/MC/COP.3/8/Rev.1, annex.

47. However, in many locations, particularly where there is small-scale gold mining activity, most carnivorous fish, even those low in the trophic order, carry an elevated mercury body burden, which they pass onto humans when consumed. For communities that rely on fish as the main form of protein in their diet, this can have serious health consequences.[47] This includes indigenous peoples, fishing communities, populations of small island developing States, including Pacific island nations, and communities that have a cultural tradition of high fish consumption.

48. Ocean mammals, such as seals and whales, are also affected through their consumption of mercury-contaminated fish. For indigenous peoples who rely on these ocean mammals for subsistence, such as the Yupik people of St. Lawrence Island, Alaska (United States), this has also resulted in elevated mercury levels in their bodies, especially for women of childbearing age.[48]

49. Women of childbearing age in small island developing States are vulnerable to an elevated body burden of mercury owing to their reliance on fish for dietary protein. In one study, the majority of the participants – who were women aged 18–44 years, with a fish-rich diet, from Barbados, the Comoros, the Cook Islands, Fiji, Granada, Kiribati, the Marshall Islands, Solomon Islands, Sri Lanka, Tonga, Trinidad and Tobago, and Tuvalu, and from Molokai, Hawaii (United States) – were found to have mercury levels elevated above the "safe" threshold of 1 part per million[49]

50. In the north of the Plurinational State of Bolivia, members of the Esse Ejja indigenous people in the communities of Eyiyo Quibo and Portachuelo are heavily reliant on the fish from the Beni River as their primary source of protein.[50] In a recent study, women of childbearing age in both communities, many of whom claimed to feel unwell, were found to have an extremely high body burden of mercury, with hair samples showing an average level of 7.58 parts per million. These communities do not engage in gold mining or industrial activities, and the only known exposure that they have to mercury is through fish. Elevated mercury levels in two communities nearly 400 kilometres apart on the same river indicates that the entire river system may be affected and that contaminated fish may even travel great distances.

51. While global and local fish contamination by mercury is widely studied and recognized as a growing problem, other staple foods such as rice are being increasingly affected. In Indonesia, mercury was found in high concentrations in rice near several small-scale gold mining hotspots, ranging from 15 to 140 parts per billion.[51] For comparison, the recommended safe level set by the World Health Organization is 30 parts per billion, and the Indonesian allowable standard is 50 parts per billion. In 17 out of 27 provinces, Indonesian farmers grow rice in flooded paddies that are stocked with fish for pest control and as an additional food source.[52] In these cases, both the fish and rice are at risk of contamination from local small-scale gold mining activity.

52. The implications of mercury use in small-scale gold mining in terms of contamination of local and global food chains are clear. The ongoing allowable use of mercury in small-scale gold mining is compromising the right to clean food sources of millions of people around the world.

[47] Submissions by Agenda Tanzania and Clínica de Direitos Humanos.

[48] Lee Bell and others, *Mercury Threat to Women and Children across Three Oceans: Elevated Mercury in Women in Small Island Developing States* (Göteborg, International Pollutants Elimination Network, 2018).

[49] Ibid.

[50] See communication BOL 3/2021.

[51] Sarah E. Rothenberg and others, "Stable mercury isotopes in polished rice (*Oryza sativa* L.) and hair from rice consumers", *Environmental Science and Technology*, vol. 51, No. 11 (6 June 2017).

[52] See https://core.ac.uk/download/pdf/33722608.pdf.

B. Groups in vulnerable situations

1. Mining communities

53. Small-scale gold mining communities are on the fenceline of exposure to mercury, often pushed into such mining activity by sheer poverty, and unaware of the deleterious impact of mercury. Between 14 million and 19 million people work in small-scale gold mining in 70 countries, and estimates report that 25 to 33 per cent of miners suffer from chronic intoxication from metallic mercury vapour.[53] Some indigenous communities also practise small-scale gold mining using mercury, which breeds conflict within and among indigenous peoples.

54. In Peru, the Arakbut indigenous people in the Madre de Dios region, despairing at the invasion of their land by illegal miners, are now resorting to harmful gold mining themselves. The Arakbut report that mining drove away their food sources, such as wild animals, led to widespread deforestation, contaminated fish with mercury, and damaged sacred sites, undermining their spirituality and cultural norms. Social effects brought by the miners include use of alcohol, drugs and violence, with an increase in sexual exploitation and sexually transmitted diseases. One Arakbut leader identified globalized finance as a key driver, noting the responsibility of multilateral banks: "not only [are they] financing the extractive industry in our Amazon, [but] their reserves of gold bullion came from the soil of our ancestral territories".[54]

2. Indigenous peoples

55. The human rights of indigenous peoples, including those living in isolation, are being trampled in the rush to extract gold, especially in protected biodiverse areas where industrial gold mining is not permitted. This raises the question as to whether the global gold industry is knowingly using small-scale gold miners to gain access to gold deposits that otherwise cannot be legally obtained.

56. Indigenous peoples living a subsistence lifestyle and taking no part in gold mining are being heavily affected by the contamination and violence associated with the wildcat gold-mining activity. The indigenous peoples of the Amazon basin are under increasing threat from gold mining, with their traditional lands increasingly being invaded by miners, known as *garimpeiros*, who are often armed and are intent on establishing *garimpos* (makeshift gold mines) and using violence to obtain access to indigenous lands.

57. The environmental injustice of this situation is plain. The lack of effective protections and remedies for the harm caused by small-scale gold mining using mercury reveals structural racism against indigenous peoples.

58. Brazil claims to have mercury restrictions and legal clauses to protect indigenous people, even as it attempts to regress on existing standards and open up indigenous lands to gold mining and other extractive industries.[55] This has led to a culture of impunity among miners, who believe they have government support. The push by miners into protected lands affects the most remote indigenous peoples through direct contact, destruction of habitat and food sources, and contamination of river fish.

59. Recent research conducted with the Munduruku indigenous people in the State of Pará, Brazil, detected mercury in all hair samples analysed from 200 people – men and women, adults (including older persons) and children – without exception.[56] The highest levels of mercury contamination were reported in the villages closest to small-scale gold mining activities. People with the highest levels of contamination had a greater frequency of neurological symptoms, such as changes in tactile and pain sensitivity, motor and memory

[53] Submission by the International Labour Organization (ILO).

[54] See https://www.iwgia.org/en/news/4569-mining-activity-in-the-peruvian-amazon-is-impoverishing-the-arakbut-indigenous-people.html.

[55] See communication BRA 4/2022, available at https://spcommreports.ohchr.org/TMResultsBase/DownLoadPublicCommunicationFile?gId=27186.

[56] Submission by the Oswaldo Cruz Foundation.

challenges, and delay in verbal fluency. Children under 6 years old showed neurodevelopmental issues, anaemia and malnutrition.

60. Also in the State of Pará, the Kayapó indigenous territory is home to several indigenous communities, including groups in voluntary isolation from the outside world. The rate of deforestation in the Kayapó region due to gold mining has doubled since 2000.[57] While it is illegal to mine on indigenous lands in Brazil, the indigenous people say that this has not stopped widespread encroachment by miners onto their land. The National Indian Foundation – the government agency tasked with protecting the interests of indigenous peoples in Brazil – has identified almost 3,000 indigenous people contaminated by mining residues.[58]

61. Approximately 1,000 Yanomami people live in communal houses in Palimiú, a village on the banks of the Uraricoera River in the largest indigenous reserve in Brazil. It can be reached by boat or light aircraft only. In May 2021, several boats operated by *garimpeiros* opened fire on the Yanomami tribe on the riverbanks with automatic weapons. The villagers responded with arrows and shotguns. There were injuries on both sides and two young boys drowned in the chaos, with the miners threatening to return for vengeance. The police arrived the next day and the *garimpeiros* returned by boat, opening fire on the federal agents, who drove them away with counterfire. Government prosecutors in the State of Roraima believe that miners may have hired one of the largest criminal gangs in Brazil – known as Primeiro Comando da Capital, which has smuggling routes in the area – to terrorize indigenous people.[59]

62. The Wayana people of Suriname are affected by the mercury contamination of rivers and fish, escalation of health issues and deforestation that result from small-scale gold mining.[60] Making matters worse, Suriname is alleged to be selling indigenous land to gold-mining organizations.[61]

63. In Sumatra, Indonesia, indigenous community-based forest management initiatives in the Batanghari Protected Forest are being rapidly undermined by a resurgence of small-scale gold mining.[62] Indigenous people are concerned that the frequent police and military patrols that ended the mining in 2014 have dwindled, to the point that miners feel that they are no longer at risk of penalties. Despite government claims that such mining had been eradicated, Indonesian non-governmental organizations recently identified 6 active and 22 abandoned mines, and 33 excavators operating inside the Batanghari Protected Forest in the district of South Solok alone, along the Batang Bangko River.[63] Disturbingly, the miners claim that local government officials and police receive a percentage of the operation to protect them.

64. In the Plurinational State of Bolivia, in April 2022, a group conducting an inspection of an illegal mining operation was attacked with dynamite, stones and fireworks. Members of the Senate's Commission on Land and Territory, Natural Resources and Environment, and representatives from Amazonian indigenous peoples' organizations came under attack near the Chushuara community. While they were forced to leave the area within the Madidi National Park and Integrated Management Natural Area, they were able to confirm the presence of a massive dredger, *La Reina*, operating on the river just outside the protected

[57] Environmental Justice Atlas, "Illegal mining in indigenous territories, Kayapó, Pará, Brazil", 26 November 2018.

[58] See Remis Balaniuk, Olga Isupova and Steven Reece, "Mining and tailings dam detection in satellite imagery using deep learning", *Sensors*, vol. 20, No. 23 (December (I) 2020); and https://news.mongabay.com/2019/12/illegal-gold-rush-causing-irreversible-damage-to-rivers-in-the-brazilian-amazon/.

[59] Submission by Hutukara Associação Yanomami and the Oswaldo Cruz Foundation; see also https://www.bbc.com/news/world-latin-america-57157017.

[60] Submission by the University of Oklahoma; and https://www.undp.org/suriname/news/effectively-managing-gold-mining-suriname/.

[61] Submission by the University of Washington School of Public Health.

[62] Helmi and others, "Documenting legal protection of indigenous forests in realizing indigenous legal community rights in Jambi Province", *Library Philosophy and Practice*, 16 September 2019.

[63] See https://news.mongabay.com/2020/02/indonesia-sumatra-gold-mining-illegal-deforestation-environment/.

zone.[64] Indigenous peoples in the Plurinational State of Bolivia are now fearful that these violent incursions will lead to State militarization of indigenous lands and further marginalization of their customary rights, practices and autonomy.

65. These examples of sweeping and systematic incursions into indigenous lands and territories and conservation areas highlight the growing violence and intimidation experienced by indigenous peoples from some small-scale gold miners. They also illustrate the long-term environmental, social and cultural damage that undermines indigenous autonomy, self-determination and ability to rely on natural resources. A notable complaint of many indigenous people is the loss of food sources from the forests and contamination of fish in the rivers, which had previously served as the foundation of their customary subsistence lifestyles and culture. Fish contamination results from mercury use in small-scale gold mining and evidences grave environmental injustice.

3. Women and girls

66. Women and girls in locations with significant small-scale gold mining activity are vulnerable to a range of effects that undermine their human rights. Even in the Pacific islands, where there is virtually no such mining, women and girls have consistently elevated mercury levels from their reliance on fish that have become contaminated by global mercury pollution of the oceans, of which small-scale gold mining emissions and releases are a major source.

67. Women and girls aged 14–45 years are particularly vulnerable to the neurotoxic impact of mercury. Particular risks involve the impact on unborn children. In utero exposure to mercury at very low levels can result in significant IQ deficits and developmental disorders. If mothers have highly elevated mercury levels, their children can be born with deformities, severe cognitive impairment, and symptoms reported in Minamata disease such as paraesthesia, ataxia, dysarthria, tremors, and constriction of visual fields, or "tunnel vision". These symptoms can be progressive and sometimes fatal. Offspring of survivors of Minamata disease have intellectual disabilities, limb deformities, chorea, seizures and microcephaly.

68. The United States Environmental Protection Agency uses the threshold of 1 part per million total mercury, measured in hair samples, above which it assumes that detrimental neurotoxic effects of mercury can begin to manifest in a fetus. Scientific analysis suggests that even this threshold is too high and the actual level at which the fetus is affected is 0.58 parts per million.[65]

69. Women are directly exposed to mercury while working in the gold amalgamation process. Many more are exposed when the gold ore is processed in their homes in ball mills or when the amalgam is burned in their kitchens.[66] Food chain contamination, especially of fish, exposes millions of women to elevated levels of mercury that put their health and the health of their unborn children at risk, including in small island developing States.[67] In areas of Bolivia (Plurinational State of), Brazil, Indonesia and Venezuela (Bolivarian Republic of), women dependent on fish for their protein have an extremely high body burden of mercury.[68]

70. In addition to the direct impact of mercury from mining and indirect impact through food chain contamination, women and girls are also affected by the exceptionally hard labour required to move and process ore and tailings.[69]

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[64] Submission by Coordinadora Nacional de Defensa de Territorios Indígenas Originarios Campesinos y Áreas Protegidas, and press release, 1 April 2022, available at https://twitter.com/contiocap/status/1510251418766221315/photo/1.

[65] Philippe Grandjean and others, "Calculation of mercury's effects on neurodevelopment". *Environmental Health Perspectives*, vol. 120, No. 12 (December 2012).

[66] Submission by Nexus3.

[67] Bell and others, *Mercury Threat to Women and Children*.

[68] Lee Bell, Dave Evers and Mark Burton, *Mercury Exposure of Women in Four Latin American Gold Mining Countries* (Göteborg, International Pollutants Elimination Network, 2021); and Lee Bell and others, *Global Report: Mercury in Women of Child-Bearing Age in 25 Countries* (Göteborg, International Pollutants Elimination Network, 2017).

[69] Submission by Nexus3.

71. The social impact in mining areas includes greater levels of violence and sexual violence against women and girls by male miners, criminal gangs and police. Where women have claims to gold concessions or extract gold, they are often threatened and intimidated to force them off claims or to relinquish gold cheaply.[70] Mining gold-rush hotspots are often accompanied by a sharp rise in networks involved in luring local girls into sexual exploitation as a way out of poverty.

72. In one recent study of active small-scale gold mining areas in Suriname and French Guiana, up to 27 per cent of women who responded to the survey and were involved in mining-related activity listed their occupation as prostitution.[71] Most others were either miners or worked in the supporting service industries, and they highlighted the lack of health and reproductive services and risks of accident and disease.

4. Children

73. Child labour is endemic in most small-scale gold mining locations. Extreme poverty, lack of education and economic opportunities, and expectations of supporting family who work in the mines tend to lock children into small-scale gold mining.

74. Tens of thousands of children are engaged in small-scale gold mining across the globe. They risk disease, mercury poisoning, drowning and myriad injuries from rock falls, explosions, tunnel collapse, machinery accidents and falls into disused pits and shafts. Other risks include poor ventilation, water-filled shafts, loud machinery and dust and vapour exposure.[72] The International Labour Organization (ILO) has noted that the combined effects of such exposure coupled with fatigue or exhaustion can lead to serious respiratory conditions such as silicosis, headaches, hearing and sight problems, joint disorders and various dermatological, muscular and orthopaedic ailments and wounds, jeopardizing both their mental and their physical long-term health.[73]

75. In Burkina Faso and the Niger, 30 to 50 per cent of the entire small-scale gold mining sector (estimated at between 200,000 and 500,000 across the two countries) are aged under 18 years, while approximately 70 per cent of the children are aged under 15 years.[74] Contaminated water and malnutrition exacerbate diseases such as dysentery, diarrhoea, malaria, meningitis, measles, tuberculosis and other parasitic and viral infections. It is estimated that up to 10,000 children may be involved in gold mining in Ghana, performing low-skilled tasks, including building trenches, carrying loads of gold ore on their heads to washing sites (mostly girls), washing the ore (mostly boys), amalgamating the gold using mercury, and selling the product.

76. The increase in migrant labourers, including children, has led to an increase in sexual exploitation, including trafficking, often involving girls as young as 12 years old. This has inevitably led to increased teenage pregnancies, single parenting and sexually transmitted diseases, particularly HIV/AIDS.[75]

77. A 2006 ILO study of small-scale gold mining in Côte d'Ivoire identified trafficking of children for labour in slave-like conditions from neighbouring Burkina Faso, Guinea and Mali. The children were fed little, paid poorly and often resorted to abusing amphetamines to make it through their 10-hour working day.[76]

78. Child labour in small-scale gold mining is also common in Mongolia and the Philippines. In the Philippines, children are often involved in the dangerous practice of compressor mining, whereby they dive to remove ore from underwater pits, with zero

[70] See https://mukasirisibanda.wordpress.com/2017/12/07/womens-voices-gender-based-violence-in-asm-sector/.

[71] See https://www.sciencedirect.com/science/article/pii/S0277953622000508.

[72] Submission by Human Rights Watch.

[73] ILO, "Child labour in gold mining: the problem", June 2006; see also https://journals.sagepub.com/doi/full/10.1177/20503121221076934.

[74] World Bank, *2020 State of the Artisanal and Small-Scale Mining Sector* (Washington, D.C., 2020).

[75] Ibid.; and Human Rights Watch, *Precious Metal, Cheap Labor: Child Labor and Corporate Responsibility in Ghana's Artisanal Gold Mines* (New York, 2015).

[76] ILO, "Child labour in gold mining".

visibility, receiving air through a basic face mask from a crude tube attached to a compressor at the surface.[77]

79. In Latin America, it is estimated that 65,000 children participate in small-scale gold mining in Bolivia (Plurinational State of), Ecuador and Peru. Children work with their parents in activities such as ore extraction and mercury amalgamation, often unpaid. Owing to cultural beliefs, miners generally do not allow females to enter the mines: the majority of children working down in the mines are boys. Girls process the ore and sort the mineral from the slag outside the mine.[78]

80. In Uganda, small-scale gold mining poses not only a health risk but also a threat to children's education. The country sees high levels of school dropouts in such mining communities.[79]

81. Children are among the most vulnerable of populations involved in the deleterious practice of small-scale gold mining and whose human rights are most compromised in the quest to extract more gold.

IV. Minamata Convention on Mercury

82. Growing scientific evidence in the late twentieth century pointed to widespread global contamination by mercury from industrial and mining sources. In 2001, the UNEP Governing Council called for a global assessment of mercury, focusing on health effects, sources, long-range transport, mercury chemistry and methods to control mercury pollution. In 2002, the assessment documented global adverse effects.[80]

83. In 2005, UNEP established the Global Mercury Partnership, promoting voluntary measures to reduce mercury pollution. After reviewing the effectiveness of voluntary measures, in 2009 the Governing Council called for negotiation of a global, legally binding agreement on mercury.

84. The Minamata Convention was adopted on 10 October 2013 at a diplomatic conference held in Kumamoto, Japan, and subsequently entered into force on 16 August 2017. The Convention's objective is to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds.

85. The Convention includes provisions for no new primary mercury mines, eventual phase-out of existing mines, and phase-out and phase-down of mercury products and industrial processes, and measures to reduce emissions and releases of mercury from industrial sources. These are all positive developments that have reduced the legal trade of mercury globally from 3,500 tons in 2013 to 891 tons in 2020. [81]

86. The Convention also seeks to regulate the informal practice of gold mining or small-scale gold mining. In this regard, however, it has several weaknesses that limit its effectiveness in reducing and eliminating mercury use in small-scale gold mining. These shortcomings undermine the human rights of the people involved and "innocent bystanders" affected by mercury contamination. They also enable the onslaught of illegal miners in indigenous lands and protected areas.

A. Regulations on small-scale gold mining

87. The Convention addresses small-scale gold mining directly through article 7 and annex C (national action plans), and indirectly through other articles on definitions (art. 2), supply and trade (art. 3), capacity-building and technology transfer (art. 14) and health (art. 16). Neither article 7 nor annex C requires prohibition of the use of mercury in small-

[77] Ibid.
[78] World Bank, *2020 State of the Artisanal and Small-Scale Mining Sector*.
[79] Submission by Karamoja Women Cultural Group.
[80] UNEP, *Global Mercury Assessment* (Geneva, 2002).
[81] See https://resourcetrade.earth/?year=2020&category=1512&units=weight&autozoom=1.

scale gold mining; instead, parties must "take steps to reduce and where feasible eliminate" it.

88. Under article 2 (k), small-scale gold mining is a "use allowed" of mercury. The interplay between this definition and article 3 (6), governing trade, has the effect of allowing exports of mercury for small-scale gold mining.

89. Article 3 prohibits the use in small-scale gold mining of mercury from primary mining and decommissioned chlor-alkali facilities. However, during the past decade, primary mining in Mexico has supplied large amounts of mercury for small-scale gold mining in Latin America.[82]

90. During the Convention negotiations, some felt that prohibiting the use of mercury in small-scale gold mining could be ineffective, given the sector's informality, and could deny miners a livelihood, relegating them to poverty. Others proposed that banning mercury from such mining would release miners from a toxic livelihood that affected not only miners and their families, but also women and children who have nothing to do with mining but suffer the effects of mercury from consequent food chain contamination. The former position prevailed, with devastating impacts on human rights.

91. Another argument frequently raised is that banning mercury use would be counterproductive, as it would drive mercury trade into the black market, making it more difficult to engage mining communities to formalize their activities. However, the black market in mercury for such mining has arisen despite ongoing legal mercury trade, and at times is actually enabled by the diversion of mercury shipments. Besides, the counterfactual thinking that formalization efforts would be more difficult cannot justify the human rights violations and abuses suffered by communities downstream that are exposed to releases of mercury from small-scale gold mining.

B. National action plans

92. Article 7 of the Convention requires parties with significant small-scale gold mining activity to submit to the secretariat a national action plan thereon within three years of the Convention's entry into force for that party and a three-yearly review thereafter. Under annex C, the plans must include elements such as national objectives and reduction targets, and action to eliminate the most polluting practices: whole ore amalgamation, open burning of amalgam, amalgam burning in residential areas and cyanide leaching in sediment, ore or tailings to which mercury has been added.

93. While annex C requires the inclusion in a national action plan of a schedule for its implementation, this does not mean setting a date for the elimination of mercury in small-scale gold mining. In fact, the inclusion of standards for mercury-free small-scale gold mining is optional.[83]

94. The Global Environment Facility (GEF), which serves as the Convention's financial mechanism, initially invested $141 million in the period 2014–2018 on programmes largely tackling small-scale gold mining activities, including support for 32 countries to prepare national action plans.[84] In its seventh replenishment (2018–2022), GEF supported 14 additional countries in developing plans.[85]

95. The Global Mercury Partnership presents detailed information on national action plans, including reduction targets.[86] These plans vary greatly in terms of States' goals, whether total elimination of mercury or a simple reduction of its use in small-scale gold mining.

[82] UNEP, *Global Mercury Supply*.
[83] Annex C, para. 2.
[84] See https://www.thegef.org/what-we-do/topics/mercury.
[85] See UNEP/MC/COP.4/INF/7.
[86] See https://www.unep.org/globalmercurypartnership/insights-asgm-national-action-plans.

96. Many see national action plans as a theatrical exercise unlikely to reach their goals.[87] Critics see a gulf of distance between the plans and actual implementation. To improve their effectiveness, the Conference of the Parties to the Convention updated its guidance on their development, calling on States to engage indigenous peoples and local communities and on the secretariat to compile views on their needs and priorities.[88]

1. Formalization

97. Formalization of small-scale gold miners is regarded under the Convention as a key strategy for national action plans to reduce miners' impact on the environment and improve their working conditions. Formalization includes training in techniques for non-mercury gold mining and reduction of exposure when using mercury.

98. It has been argued that formalization can reduce the incidence of indentured labour and displace criminal syndicates while improving social order, the local economy, and legal investment and capital. Yet, according to some studies, that view may be overly optimistic and that formalization does not automatically lead to improved conditions for ordinary workers.[89]

99. Formalization is not a substitute for mercury use, which is inexpensive, is widely available and generates rapid returns for miners. At best, it may be a starting point to transition away from mercury. However, power imbalances play a key role, with impoverished miners forced by gold traders, investors and project owners to work with mercury that they provide to ensure rapid returns to the buyer. This locks miners into an economic cycle driven by mercury supply rather than mercury demand.

2. planetGOLD

100. Supported by GEF, "planetGOLD" is led by UNEP and implemented in partnership with the United Nations Industrial Development Organization, the United Nations Development Programme and the Conservation International Foundation.[90] The GEF financing is largely focused on the reduction of mercury use in small-scale gold mining.[91]

101. The "GOLD" programme has four main components: introduction of more efficient, non-mercury technologies; strengthening of policies and regulations on small-scale gold mining; promotion of investment options and direct market access for miners; and knowledge management and communications.[92] These components support a theory of change that largely rests on formalization to enable access to financing to procure non-mercury technologies.

102. In a recent review, GEF opined that the examples of Colombia and Ecuador, where mercury use in small-scale gold mining was banned, illustrate "an unfortunate unintended consequence" of the Convention: that the complete prohibition of mercury drives miners towards illegality and makes it more difficult to work with them.[93] This perspective is misguided and ignores the human rights impact of mercury use in small-scale gold mining. The better approach is to recognize that miners will have a real incentive towards formalization with non-mercury techniques if mercury use is regarded as an environmental crime. Today, however, low penalties and inadequate enforcement, coupled with the absence

[87] Information gathered during consultations.

[88] See https://www.mercuryconvention.org/sites/default/files/documents/final_report/K2201138%20-%20UNEP-MC-COP.4-28-Add.1-%20ADVANCE.pdf, annex I.

[89] See https://www.sciencedirect.com/science/article/abs/pii/S2214790X22000399.

[90] In 2016, the Global Opportunities for Long-Term Development of the Artisanal and Small-Scale Gold Mining Sector ("GOLD") programme was approved by GEF with $45 million in funding, and was executed in Burkina Faso, Colombia, Ecuador, Guyana, Indonesia, Kenya, Mongolia, Peru and the Philippines. In 2020, GEF approved the "GOLD+" programme, expanding support to a further 15 countries with an extra $74 million, bringing total programme funding to $119 million. The "GOLD" and "GOLD+" programmes are referred to collectively as "planetGOLD".

[91] See GEF Independent Evaluation Office, *GEF Interventions in the Artisanal and Small-Scale Gold Mining Sector* (Washington, D.C., 2022).

[92] Ibid.

[93] Ibid.

of a global ban on mercury use in small-scale gold mining, lead to a low-risk/high-reward scenario that hinders formalization efforts and benefits organized crime.

103. GEF also concluded that completed GEF projects had had success in reducing mercury use from small-scale gold mining and that there had been some progress in formalization. It recommended multifocal-area interventions to address issues such as deforestation, biodiversity loss, and contamination of international waters.[94] Still, critics of planetGOLD reproach the lack of a monitoring and remediation component to measure the legacy of mercury pollution and restore contaminated sites.

C. International trade of mercury for small-scale gold mining

104. International trade in mercury is not prohibited by the Convention, but regulated under a prior informed consent regime, as mercury is still used in certain products (mostly subject to phase-out or phase-down through annex A) and industrial processes (annex B) and in some exempted uses. Certain mercury-added products are considered critical uses or are otherwise exempt under article 4, but require only relatively small quantities of mercury. The Convention also excludes the oil and gas industry from scrutiny over the amount of by-product mercury that it separates from product streams and then sells to the global market.

105. The European Union and the United States banned the export of mercury in 2011 and 2013 respectively, and these measures have reduced the overall amount of mercury traded internationally in the past 10 years. Since then, the phase-out of products and processes using mercury have further contributed to a decline in global trade in mercury. In 2010, global imports were 2,600 tons, and exports 3,200 tons,[95] and by 2020, global imports were down to 570 tons and global exports 503 tons.[96]

106. UNEP has noted that while overall trade has diminished, the supply of mercury has increased.[97] Trade statistical data do not account for illegal transboundary movements of mercury, which are commonly directed to small-scale gold mining.

107. From 2017 to 2021, the Plurinational State of Bolivia had the world's highest recorded imports. Most of that importation is from Mexico, where it is produced from primary mining, an illegal source of mercury for small-scale gold mining.[98] In the Plurinational State of Bolivia, mercury is used domestically in and frequently smuggled into other Latin American countries for small-scale gold mining.[99]

D. Gaps and shortcomings

108. The Minamata Convention is well constructed and is proving to be effective, including with respect to product and process phase-outs, and emission and releases controls. However, the Convention's approach to small-scale gold mining has shortcomings that are allowing the use of mercury in such mining to increase, as evidenced by the growth in mercury supply.[100] These weaknesses not only undermine the goals and effectiveness of the Convention, with small-scale gold mining the world's largest emitter of mercury into the environment. They also cause and aggravate mercury exposure among people in vulnerable situations, including indigenous peoples, women, children, and miners living in extreme poverty.

109. A major gap is that the Convention allows the use of mercury in small-scale gold mining (arts. 2 (k) and 7). This sends the wrong signal and suggests that mercury use and release can be tolerated if profits can be made from gold, despite the heavy human toll and proliferation of contaminated sites. While most other global processes using mercury are

[94] Ibid.
[95] Bruce Gavin Marshall and others, "Mercury challenges in Mexico: regulatory, trade and environmental impacts", *Atmosphere*, vol. 12, No. 1 (January 2021).
[96] See https://comtrade.un.org/data/.
[97] UNEP, *Global Mercury Supply*.
[98] Marshall and others, "Mercury challenges in Mexico".
[99] Jones, "Dirty business".
[100] UNEP, *Global Mercury Supply*.

banned or subject to scheduled phase-out, there are no restrictions on mercury use to extract gold.

110. It is not just gold miners who are harmed by such use of mercury. Countless indigenous peoples, island peoples, and women and children gain no benefit from gold mining, but suffer the impact of food chain contamination, exposure, body burden and intergenerational developmental effects. Small-scale gold mining pollutes rivers, causes deforestation and destroys protected habitats, driving away native animals that are important food sources and spiritual symbols to indigenous peoples.

111. Another gap is that the Convention allows primary mercury mining to continue for up to 15 years from its entry into force in 2017. This is throwing fuel on the fire of global mercury contamination, potentially adding thousands of tons of mercury to the biosphere. The demand for mercury is shrinking rapidly in all sectors owing to process and product phase-outs – except for small-scale gold mining. Mercury demand for allowable uses outside of such mining could likely be met by recovered mercury from domestic sources, rendering mercury mining completely unnecessary.

112. Yet another shortcoming is the Convention's failure to prohibit international trade in mercury for small-scale gold mining. A related gap is that it allows trade for uses of mercury in some products and processes. Even where countries have unilaterally decided to ban mercury in small-scale gold mining, the interaction of these gaps leads to diversion of mercury. Shipments are mislabelled as destined for an allowable use, such as fluorescent lighting or dental amalgam, and then diverted to small-scale gold mining. Customs officers cannot block the shipments, as trade and the purported end use are legal. The consultation process for this report revealed that no country actively tracks the fate of imported mercury shipments after they have cleared customs. This is an open door for diversion of mercury to small-scale gold mining.

113. The European Union and the United States have banned mercury exports and hold large stockpiles in disposal facilities. Their economies have suffered no discernible impact as a result. Any mercury required domestically for products and processes that are exempt from phase-out can be sourced from mercury recovered domestically from mining by-product, oil and gas by-product, contaminated site remediation, or end-of-life products containing mercury. As more products and processes using mercury are phased out through the Convention, the domestic demand of any country for mercury can be met by domestic recovery operations.

114. In short, there is no valid justification for an indefinite international mercury trade. It is clear that most of the legal and illegal trade in mercury is now destined for small-scale gold mining and thus perpetuates, and actually increases, global mercury pollution.

115. Even with trade prohibition, there will always be criminals who seek to profit from smuggling commodities such as mercury, and some of them will circumvent border controls. However, under trade prohibition, customs officers who find a mercury shipment would be able to block its movement and investigate its ownership and destination. With a global trade prohibition, any mercury appearing at a border can be rapidly identified as an illegal shipment and confiscated, unless destined for interim storage or waste.

116. As the 2022 Bali Declaration on combating global illegal trade of mercury makes plain, international cooperation through enforcement agencies and intelligence-sharing is critical to ensure that mercury smugglers are held accountable for their serious environmental crimes.

V. Conclusions and recommendations

117. Demand from major gold markets is driving the scourge of mercury use in small-scale gold mining in developing countries. The insatiable demand for gold for luxury products and as investment instruments is condemning millions of poor miners and their families to a toxic livelihood that damages their health and compromises the intellectual capacity of their children. Even the unborn children of mercury-contaminated miners risk IQ loss, poor health,

deformity and stunted educational and economic opportunities. Their rights are being permanently compromised to satisfy the market for gold bullion and jewellery.

118. The rights of indigenous peoples, in the Amazon particularly, are being trampled, their environments destroyed and their cultures fragmented by the legions of lawless miners invading their protected lands, bringing with them toxic mercury, violence, diseases, drugs, alcohol and the exploitation of women. This is tacitly enabled by high-level vested political and economic interests that occupy the shadowy space of illicit gold. The lucrative trade in smuggled gold and mercury has attracted the attention of poorly-paid and corrupt military, police and customs officials, together with unscrupulous agents of organized crime, paramilitaries and criminal gangs who prey on miners with violence, protection rackets and extortion.

119. Indigenous people who stand in the way, protecting the land and culture, are intimidated, attacked and murdered. The gold market drives this oppression, and the mercury market facilitates it.

120. Protected lands, forests and rare biodiversity are being destroyed in the quest for access to gold reserves that are just outside of the legal reach of industrial gold extraction. The small-scale gold miners who plunder these environments have become the agents of wealthy global gold traders seeking the next El Dorado of fat profit margins and an endless flow of cheap gold.

121. It is not just the miners who pay dearly to prop up this market. Mercury used by miners is dumped in tailings flowing through the soils to rivers and oceans, contaminating everything in its path, being magnified in the food chain, accumulating in fish and marine mammals and poisoning those who consume them. Downstream from the gold mines and river dredgers, Amazonian indigenous peoples, heavily reliant on fish for protein, have a skyrocketing body burden of mercury. In Pacific islands, far from any gold-mining location, mothers live with the anxiety of knowing that their mercury levels are increasingly unsafe and their children's future is at risk.

122. The Minamata Convention was negotiated to protect human health and the environment from mercury pollution. While reducing volumes of legal mercury traded internationally, largely by phasing out products and processes, it is hindered by critical shortcomings on small-scale gold mining, which is by far the largest, and increasing, source of emissions and releases of mercury into the environment.

123. Foremost among the weaknesses of the Convention is that it allows the use of mercury in small-scale gold mining with no sunset clause, signalling a lack of urgency and tacit approval for its continuation. Another is that it allows international trade in mercury for various uses, resulting in the mercury being diverted to small-scale gold mining. Yet another is that it allows extensive phase-out provisions for primary mercury mining, ensuring that fresh mercury will be pumped into the market for years to come.

124. The Convention pins much of its hope on national action plans leading to the formalization of small-scale gold miners and increased investment to reduce mercury use, improve miner conditions and increase gold-extraction levels for the benefit of miners and ultimately the gold market. However, formalization is not a substitute for mercury elimination.

125. If the global community is serious about making mercury history, it must confront the largest emitter of mercury by banning its use to extract gold. As with other forms of environmental crime, mercury and gold smuggling, and corrupt facilitators of these illegal markets, will remain. But prohibiting the legal trade and use of mercury in small-scale gold mining will send a signal to these markets that a zero-tolerance approach is at hand.

126. It is time for the Minamata Convention to become an even stronger treaty by banning global mercury trade, revoking allowable use provisions for small-scale gold mining and ending the primary mining of mercury. While a global ban on mercury trade will not be a silver bullet to end mercury use in small-scale gold mining, it is essential to bolster other elements of the Convention and make them more effective. The Convention can thus meet its potential and truly protect human health and the environment from the insidious effects of mercury.

127. **The Special Rapporteur recommends that States:**

(a) **Adopt a national strategy to eliminate the use of mercury in small-scale gold mining, informed by human rights-based principles and the Sustainable Development Goals;**

(b) **Monitor the health conditions of groups and individuals affected by the use of mercury in small-scale gold mining;**

(c) **Disseminate information on the perils of mercury, particularly among mining and downstream communities;**

(d) **Implement the ILO Worst Forms of Child Labour Convention, 1999 (No. 182), in respect of child labour in small-scale gold mining;**

(e) **Ratify and effectively implement the Minamata Convention on Mercury;**

(f) **Apply education and awareness-raising programmes for miners, including training in mercury-free small-scale gold mining;**

(g) **Engage non-governmental organizations and indigenous peoples' representatives in the development, review and implementation of national action plans;**

(h) **Design just transition programmes to support small-scale gold miners in breaking free from mercury and avoiding harmful alternatives;**

(i) **Identify, restore and clean up sites and rivers contaminated with mercury from small-scale gold mining;**

(j) **Adopt legal reforms to establish criminal sanctions for mercury use in small-scale gold mining;**

(k) **Investigate, prosecute and punish the environmental crime of mercury smuggling;**

(l) **Establish systems to trace imported mercury to its end uses;**

(m) **Formulate regional cooperation programmes to curb illegal trade in mercury;**

(n) **Establish a dedicated task force under the International Criminal Police Organization (INTERPOL) to share intelligence on mercury smuggling at the global and regional levels.**

128. **The Special Rapporteur further recommends that States amend the Minamata Convention as follows:**

(a) **Under article 2 (k) (definitions), the use of mercury consistent with article 7 (small-scale gold mining) should be excluded from the "uses allowed", to signal that the intent of the Convention is to eliminate mercury use from small-scale gold mining, rather than to tolerate it;**

(b) **Under article 3 (4) (mercury supply sources and trade), the period during which primary mercury mining already being conducted is allowed to continue should be reduced from 15 to 10 years, to turn off the tap that will otherwise continue to pour thousands of tons of mercury into a market that preferentially diverts it to small-scale gold mining;**

(c) **Under article 3 (6), parties should permit the export of mercury only for environmentally sound disposal, where allowed, to close the gap by which mercury trade is diverted for small-scale gold mining;**

(d) **Under article 3 (8), parties should not allow the import of mercury from any non-parties, to close the gap currently exploited by free-riders;**

(e) **Under article 7, parties should be required to reduce and eliminate the use of mercury in small-scale gold mining within three to five years;**

(f) **The provisions of paragraph 2 of annex C should become mandatory and include a specific timeline for parties to transition to mercury-free small-scale gold mining, not to exceed three to five years.**