



European Union Action to
Fight Environmental Crime

Mining gold and mercury pollution in the Guiana Shield

A case study on the role of the European Union in fighting
environmental crime

Work Package 4 “Case Studies”



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 320276.

ACKNOWLEDGEMENT

The research leading to these results has been carried out as part of the research project "European Union Action to Fight Environmental Crime" (www.efface.eu). EFFACE is a collaborative effort of 11 European universities and think tanks and is coordinated by the Ecologic Institute (www.ecologic.eu). The research leading to these results has received funding from the European Union FP7 under grant agreement No 320276.

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Manuscript completed in January, 2015

This document is available online at: www.efface.eu

This document should be cited as: Veening, W.J. et al., (2015). Mining gold and mercury pollution in the Guiana Shield: A case study on the role of the European Union in fighting environmental crime. A study compiled as part of the EFFACE project. The Hague: Institute for Environmental Security.

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ABSTRACT

This brief report first identifies mercury pollution as a serious and growing threat to global environmental security and the health of the community of life. It then details this threat in the biologically important Guiana Shield ecoregion located in the North East Amazon, bordering the Caribbean, where it is caused by wide-spread informal gold mining. The for the European Union pertinent legal arrangements, lacunae and dilemmas are summarised, also from a criminal law perspective and, finally, conclusions and policy implications for the EU are suggested.

Table of Contents

Executive summary	7
1 Introduction	8
2 Literature Review	9
3 Methodology	9
4 Case Presentation	10
4.1 Mercury pollution by artisanal & small-scale gold mining (ASGM) in the Guiana Shield	10
4.1.1 Background	10
4.1.2 Mercury	11
4.1.3 Release of mercury from ASGM into the environment	11
4.1.4 Ecological effects	12
4.1.5 Mercury in the food chain	13
4.1.6 Minamata	13
4.1.7 Mercury vapour	13
4.1.8 Long-term effects	14
4.1.9 The major stakeholders	14
4.1.10 Conclusion	15
4.2 The Minamata Convention	16
4.2.1 History and content	16
4.2.2 The Minamata Convention and ASGM	17
4.2.3 A moral and legal dilemma	17
4.2.4 Role of the EU in assisting Parties with ASGM sectors in the Guiana Shield	17
5 Conclusions and Policy Recommendations	19
References	20

List of Figures

<i>Figure 1: The Guiana Shield</i>	10
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LIST OF ABBREVIATIONS

ASGM	Artisanal and Small-scale Goldmining
EU	European Union
FORESEEN	Forest Remote Sensing Exchange Network
GEF	Global Environment Facility
INCs	Intergovernmental Negotiation Committees
NGOs	Non-governmental organisations
OT	French Overseas Territory
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
WWF	World Wildlife Fund

Executive summary

Mercury has long been noted as a highly toxic, non-biodegradable substance and thus a growing threat to human and environmental health if allowed to enter the environment.

The problem is becoming acute in the Guiana Shield ecoregion, located in the North East of the Amazon, bordering the Caribbean and of global ecological and cultural significance because of its forests regulating the climate, its fresh water reserves, its unique biodiversity and the cultural diversity of its indigenous communities. As a by-product of the large so-called artisanal and small-scale goldmining sector (ASGM) taking place throughout the region, elevated mercury levels have been found in all environmental compartments around the mining sites and beyond, transported over large distances by air and water.

In the in 2013 adopted Minamata Convention on Mercury all emissions of mercury to the environment are banned, except for those occurring in ASGM sector, which only is required to take steps or prepare action plans to reduce emissions without clear timelines imposed. The continued entering of mercury to the environment presents a great to present and future generations – a moral and a legal dilemma – and the EU, when it becomes a Party to the Convention, should, together with the Member States do its utmost to remedy this situation. This includes a strict implementation of its own Regulation – currently under review - to ban the exports of mercury and mercury compounds and to stimulate the application of criminal law in case the regulation is violated.

Also the EU and its Member States as the largest development cooperation collectivity in the world should assist countries with a significant ASGM sector to effectively reduce and stop mercury emissions.

1 Introduction

In the terminology of the international conventions with provisions on the forbidden use of military means during war situations, amongst them the Rome Statute of the International Criminal Court, the release of mercury into the environment causes “wide-spread, long-term and severe damage to the natural environment”.¹

The threats to human health are extremely serious and the damage to the environment is both serious and irreversible, as mercury is non-biodegradable and will stay forever somewhere in the global environment if not captured in time and stored safely.

This has been acknowledged by the EC Regulation No 1102/2008 of the European Parliament and the of the Council on the banning of exports of metallic mercury and certain mercury compounds and mixtures and the safe storage of metallic mercury of 22 October 2008, to become effective as of 15 March 2011.²

The Regulation starts with saying “(1) Mercury releases are recognised as a global threat that warrants action at local, regional, national and global level.”

The problem addressed in this study now is that this regulation is violated and that mercury is smuggled from the EU to parts of the world where it is used in the area of so-called artisanal & small-scale gold mining (ASGM) and released there without any control in the environment. The region focussed on here is the Guiana Shield in the North-East Amazon. This region is of great concern to the policy-makers in the field of mercury control as the weak governance situation hardly allows for effective control.

First a summary will be given of the impacts on human health and the environment of mercury pollution in the Guiana Shield ecoregion (and beyond!) showing the seriousness of the problem.

Then the response of the global community to address the threat of mercury entering the environment, the so-called Minamata Convention³ will be discussed, especially as it relates to ASGM.

Finally, the issues of bringing the existing body of EU mercury-related legislation – in particular the above-mentioned Regulation - in line with the intended ratification of the Convention by the EU will be identified.

In its current form the Minamata Convention does not contain provisions for the application of criminal sanctions and EU Regulation 1102/2008 only speaks of ‘penalties’ to be applied by the Member States.

However, these penalties should be “effective, proportionate and dissuasive”, the same language as used by the Environmental Crime Directive when criminal sanctions are mentioned.

On the global and EU level the release of mercury in contravention of the requirements of the Convention and the Regulation may therefore in a formal sense not be termed an ‘environmental crime’, but with growing insights in the toxic effects on health and the environment and the continuation of the additions to the ‘global pool’ of mercury it will only be a matter of time for this to happen.

¹ Environmental Security: United Nations Doctrine for Managing Environmental Issues in Military Actions. Millenium Project. Available at <http://www.millennium-project.org/millennium/es-un-chapt1.html>

² European Union. 2008. Regulation (EC) No 1102/2008 of the European Parliament and of the Council of 22 October 2008 on the banning of exports of metallic mercury and certain mercury compounds and mixtures and the safe storage of metallic mercury. November 14, 2008. Official Journal of the European Union L 304/75. Available at <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008R1102>

³ See www.mercuryconvention.org

2 Literature Review

On the sources and extent of the mercury pollution around the world the most comprehensive and authoritative references are the 'Global Mercury Assessments' by the United Nations Environment Program (UNEP). Here use is made of the 'Global Mercury Assessment 2013. Sources, emissions, releases and environmental transport.'⁴

The position of the countries in the focus region of this case study, the Northern Amazon region of the Guiana Shield, vis-à-vis the Minamata Convention has been analysed and described in an internal IES report of April 2014.

On the spread and impacts of the mercury pollution in and beyond the Guiana Shield ecoregion many references to the literature of a more specific nature are given in the next section.

Finally, it would have been highly desirable if the review of the implementation of Regulation 1102/2008, banning the export of mercury and mercury containing compounds from the EU, would have been available as announced at the end of 2014. This being not the case, and, as the regulation provides the main handle for the application of criminal law to the combat of mercury pollution by the EU, this version of the case study report can only be preliminary.

A more complete analysis and more detailed recommendations can only be given once this review has been published.

3 Methodology

While the environmental impact of the violations, both in a formal and in a material sense, of the regulations at hand, described in quantitative terms in the ecoregion of the Guiana Shield, forms the reason of the study – see Case Presentation – the methodology used is a qualitative one. The main applicable legal arrangements, the UN Minamata Convention on Mercury ("Minamata Convention") and the EU Regulation 1102/2008 are summarised as to their history, content and relation to criminal law. Special attention has been given to the relation of the Guiana Shield countries in the negotiations and adoption by the countries of the Guiana Shield region of the Convention by studying the official documents of the INCs (the Intergovernmental Negotiation Committees) and by correspondence with some of the functionaries in these countries.

As to the EU Regulation the official documents were studied, a full-day public consultation on 7 July 2014 in Brussels, organised by the European Commission, was attended - where also an intervention was made on behalf of EFFACE - and an interview on the violation of the ban to export mercury with one of the competent inspectors was held.

As mentioned under the literature review a formal review of the regulation, announced for late 2014, will only become available later in 2015, hopefully to be included in the final recommendations by EFFACE in 2016.

Based upon the description of the environmental impact of the mercury pollution and the summary of the available legal arrangements conclusions and policy recommendations are formulated looking at the effectiveness of the existing laws, sanction regimes, gaps in coverage, and policy options outside the legal field in *sensu stricto*.

⁴ United Nations Environment Program. (2013). Global Mercury Assessment 2013. Sources, emissions, releases and environmental transport. Geneva: UNEP Chemicals Branch (2013).

4 Case Presentation

4.1 Mercury pollution by artisanal & small-scale gold mining (ASGM) in the Guiana Shield

4.1.1 Background

The Guiana Shield Ecoregion located in the Northern Amazon and bordering the Caribbean – see map below – is of great importance to the ecology of the planet. It covers 270 million hectares of mostly pristine tropical rainforest, storing 10 billion tons of carbon (10% of all terrestrial; carbon), sequestering an estimated 50 million tons of CO₂ per year, containing 10-15% of the world's fresh water reserves and providing a repository of an extremely high variety of endemic fauna and flora.

Beyond that it is a region with still large numbers of indigenous communities who act as guardians of these tremendous ecological wealth.⁵

Figure 1: The Guiana Shield



Source: Guiana Shield Facility

The ecological and cultural integrity of the region is, however, seriously threatened by the environmental and social impacts of the gold mining sector in the area. While the social disruptions in the form of bringing diseases, prostitution, gambling and violence to the communities are very serious, they fall outside the scope of this case study on environmental crime. Here the focus is on the mercury pollution by the expanding gold mining activities in the Shield.

⁵ The unique role of these communities has been the object of another project funded by the FP-7 programme, the so-called COBRA project. See www.projectcobra.org

4.1.2 Mercury

Mercury is a non-biodegradable pollutant and therefore it is impossible to make it disappear once it is released into the environment. Mercury is used for a vast array of purposes, such as artisanal and small-scale gold mining (ASGM), coal-fired power plants, the cement industry and the production of steel. These four industries are responsible for almost all mercury emissions in the world.⁶ Nowadays, major mercury emissions are unnecessary, but mercury's relatively low cost compared to alternatives perpetuates its use.

This report focuses on mercury pollution derived from ASGM in the Guiana Shield. The Guiana Shield is rich in mineral resources and it ranks one of the fastest growing regions of gold production. In Suriname, gold is the number one export product. In 2011 21,000 kilograms of gold were extracted from the soil.⁷ Guyana and French Guiana do not produce as much gold, however, the combination of ASGM within their own territory and the trans-boundary effects of mercury pollution results in an equally large problem.

4.1.3 Release of mercury from ASGM into the environment

Amongst intentional-use sectors ASGM is the largest source of atmospheric mercury worldwide. Artisanal gold miners collect gold-laden river sediments and add mercury. A chemical reaction takes place, forming an amalgam: a combination of mercury and gold. By roasting the amalgam, the gold particles are separated from the mercury. The gold can be sold for an astronomical amount of money and, essentially, all of the mercury ends up in the environment.

The mercury is released into the environment in two forms: its metallic form during amalgamation and as a mercury vapor during roasting. In the Guiana Shield, this results in mercury being emitted into the atmosphere, water, soil, forests and urban areas. It is estimated that 1 - 3kg of mercury are used for every 1kg of gold produced⁸, meaning that in Suriname alone at least 20,000 kg of mercury are released into the environment each year. Most ASGM operations are located near stream courses, and much of the mercury is lost to rivers and other water surfaces.⁹ This contamination leads to devastating ecological effects.

Figure 2 below shows the gold mining operations in the Guiana Shield and thus the sources of the mercury pollution in and from the region, based upon satellite images. The dark red spots indicate the major areas of ASGM.

⁶ United Nations Environment Program. (2013). Global Mercury Assessment 2013. Sources, emissions, releases and environmental transport. Geneva: UNEP Chemicals Branch (2013).

⁷ Gurmendi, A.C. (2011). 2011 Minerals Yearbook. French Guiana, Guyana and Suriname. *United States Geological Survey* (2012): 11.9.

⁸ Gray, J.E., et al. (2002). Mercury and methylmercury contamination related to artisanal gold mining, Suriname. *Geophysical Research Letters* 29.23 (2002): 20-1.

⁹ Hays, P. and Vieira R. (2007). Mercury contamination, a legacy to handicap a generation. *WWF Guiana's Regional Program Office Technical Paper Series 2* (2007).

Figure 2: Spatial distribution of forest cleared for mining expansion in the Guiana Shield during the period 2000-2013 (red). Result based on semi-automated analysis of more than 2,500 satellite images (MODIS, Landsat and ALOS PALSAR).

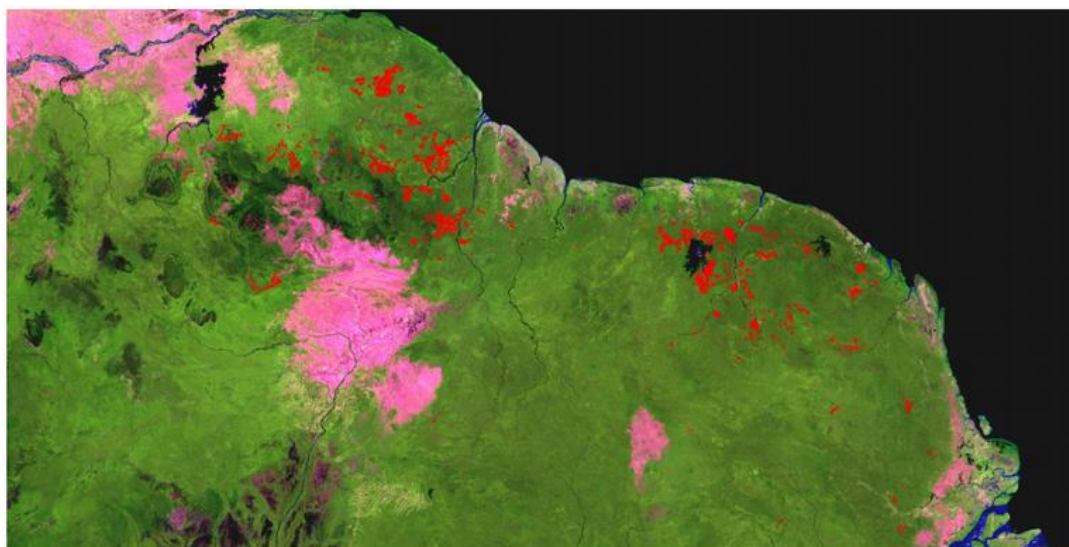


Image processing: SarVision. Satellite imagery courtesy of USGS/NASA, JAXA/METI.

4.1.4 Ecological effects

The toxicity of mercury poses a serious threat to sensitive and diverse ecosystems. In the tropical rainforest of the Guiana Shield the effects may be even more profound because evidence suggests that the higher temperatures, higher organic matter and increased biological activity associated with rainforest habitats increases the rate of mercury conversion to its more toxic form: methylmercury.¹⁰ Mercury causes negative effects across the entire spectrum of the ecosystem. It induces root damage in plants, inhibiting their water and nutrient supply. It adversely affects breeding in many bird species resulting in fewer eggs being laid and higher embryo mortality.¹¹ It is a potent neurotoxin to mammals causing, amongst other things, negative behavioural, hormonal and reproductive changes.¹²

In the Guiana Shield elevated mercury levels have been discovered in every environmental compartment researched: soil, aquatic sediment, wildlife and people, showing how widespread the problem is. The contamination is highly correlated with ASGM activities, demonstrated by elevated levels of mercury in the direct vicinity of ASGM operations.¹³ This has a direct, negative effect on the immediate surroundings. However, mercury pollution is not only a local problem. Pollution does not respect human boundaries, and mercury can be equally prevalent in designated areas of conservation as in the known contamination sites surrounding the mining operations.¹⁴

The movement of mercury-contaminated water is an international concern. Gold mining activities in Brazil discharge nearly 40 tons of mercury annually, with significant pollution risks to the Amazon Basin, the largest drainage system in the world.¹⁵ Currents also transport mercury-polluted water from Brazil to the coasts of the Guianas and onwards into

¹⁰ Lacerda, L.D., and Salomons, W. (1998). Mercury from gold and silver mining: a chemical time bomb? *Springer-Verlag, Berlin* (1998).

¹¹ Boening, D.W. (2000). Ecological effects, transport, and fate of mercury: a general review. *Chemosphere* 40.12 (2000): 1335-1351.

¹² Scheuhammer, A.M., et al. (2007). Effects of environmental methylmercury on the health of wild birds, mammals, and fish. *AMBIO: A Journal of the Human Environment* 36.1 (2007): 12-19.

¹³ Gray, J.E., et al. (2002). Mercury and methylmercury contamination related to artisanal gold mining, Suriname. *Geophysical Research Letters* 29.23 (2002): 20-1.

¹⁴ Howard, J., et al. (2011). Total mercury loadings in sediment from gold mining and conservation areas in Guyana. *Environmental monitoring and assessment* 179.1-4 (2011): 555-573.

¹⁵ Spiegel, S.J., and Veiga, M.M. (2005). Building capacity in small-scale mining communities: health, ecosystem sustainability, and the Global Mercury Project. *EcoHealth* 2.4 (2005): 361-369.

the Caribbean Sea. Near the Venezuelan city Cumana, where there are no industries involved with the use of mercury, high concentrations were discovered in several fish species, possibly because the mercury travelled on the Guiana Current to Venezuela.¹⁶ Elevated levels of mercury in fish have been documented throughout South America confirming the assertion that mercury can travel major distances.

4.1.5 Mercury in the food chain

Numerous aquatic microorganisms transform metallic mercury into methylmercury, a highly toxic compound that strongly binds with lipids and proteins, becoming easily assimilated into the food chain. Mercury accumulates in periphyton, leading to contamination of fish and people who eat fish. Mercury is not broken down in living organisms and therefore biomagnifies with increasing trophic level, reaching dangerously high concentrations in humans. The consequences include neurological damage and sterility. Mercury is also passed from pregnant women to fetuses, causing alarming affects from spontaneous abortion to severe retardation and neurological symptoms in the child.¹⁷

Bioaccumulation in the food chain is the primary source of methylmercury to humans in Suriname.¹⁸ The risk disproportionately affects indigenous and tribal communities because they are avid consumers of fish, which exposes them to unhealthily high levels of mercury.¹⁹ However, mercury in the food chain is not only a concern for indigenous communities. By transporting fish to cities urban populations also suffers the consequences of the use of mercury at mining sites. Mercury can also travel extremely long distances in water systems before being methylated. This is a considerable problem in Ecuador, where mercury travels from inland ASGM operations to the coastal plains, bioaccumulating in the intensive shrimp farms and creating a serious health risk.²⁰ Upon entering the food chain mercury becomes an international threat. Numerous studies have confirmed the negative health impacts of mercury upon people who are not employed in gold mining activities but do eat a regular fish diet.

4.1.6 Minamata

One of the most serious environmental disasters relating to mercury took place in Minamata, a small village in the South of Japan. Chisso, a major petrochemical and plastics company, spilled an estimated 27 tons of mercury into the nearby bay between 1932 and 1968. It took years before this huge contamination was noticed by the authorities and linked to Chisso Corporation. During that time mercury bioaccumulated in shellfish and fish, and the population of Minamata used the sea as a part of their daily life. Many people became seriously ill with symptoms such as blindness, seizures and sensory disorders. Research conducted in 2001 suggests that as many as two million people may have suffered milder symptoms such as headaches or loss of hearing. Officially 2,265 people have been diagnosed with Minamata disease, more than 900 of who have died.²¹

4.1.7 Mercury vapour

As well as being released into the environment in its metallic form mercury from ASGM is emitted as a vapour during the burning stage. Inside the lungs mercury is oxidised, forming complexes that are soluble in body fluids and can therefore be transported into the brain and other organs. Neurological complaints such as ataxia, tremors and lack of coordination are common symptoms of mercury intoxication, amongst both miners and gold shop workers.²² Although mining activities usually take place far away from cities, urban gold buy-up shops often heavily exceed the legal mercury limits.

¹⁶ Shrestha, K.P. (1988). Mercury Content of some marine fish from the Southern Caribbean Sea. *The science of the total environment* 73 (1988): 181-187.

¹⁷ World Health Organization (WHO) International Programme on Chemical Safety. (1990). *Environmental Health Criteria 101: Methylmercury*. Geneva: World Health Organization (1990).

¹⁸ Peplow, D. and Augustine, S. (2007). Community-directed risk assessment of mercury exposure from gold mining in Suriname. *Revista Panamericana de Salud Publica* 22.3 (2007): 202–210.

¹⁹ Habashi, F. (1997). Acute poisoning occurs when mercury ion concentrations reach 0,2 mg per 100 mL of blood. *Handbook of extractive metallurgy*. Weinheim: Wiley-VCH (1997) p. 917.

²⁰ Guimaraes, J.R.D., et al. (2011). Long-range effect of cyanide on mercury methylation in a gold mining area in southern Ecuador. *Science of the Total Environment* 409.23 (2011): 5026-5033.

²¹ McCurry, J. (2006). Japan remembers minamata. *The Lancet* 367.9505 (2006): 99-100.

²² Veiga, M.M. (1997). Mercury in artisanal gold mining in Latin America: Facts, fantasies and solutions. *UNIDO-Expert Group Meeting-Introducing New Technologies for Abatement of Global Mercury Pollution Deriving from Artisanal Gold Mining, Vienna, Austria*. 1997.

In 2006 and 2007 the University of Suriname investigated the urban mercury pollution in Paramaribo.²³ Inside the gold shops, the measurements transcend three to almost sixty times the occupational levels.

Mercury vapor is chemically relatively inert and can therefore be easily transported globally, becoming an international pollution issue. In Scandinavia and North America fish from low-productive lakes have been found to have high mercury content, which can only be attributed to widespread air pollution and long-range transport of pollutants.²⁴ Growing mercury emissions from human sources are also contributing to the 300 tons of the toxic contaminant that end up in the Arctic every year.²⁵ Clearly, mercury pollution is not only a local problem.

4.1.8 Long-term effects

Mercury contamination from ASGM still persists long after mining activities stop. Former gold-mined soils remain sources of mercury for methylating bacteria, and fish and wildlife still experience continued elevated mercury exposure after mercury use ceases.²⁶ The structure of the soil microbial community is altered from mercury pollution, slowing primary production.²⁷ The long-term effects of such alterations in the normally highly productive tropical forests of the Guiana Shield are not yet fully understood but likely to be detrimental. Furthermore, mercury polluted sites present long-term health risks to individuals residing in mining regions.²⁸ Women can become sterile and serious health defects can be passed on to the next generation, even when the mother shows no obvious symptoms.

Mercury is non-biodegradable and therefore cycles around in the environment without disappearing until it is buried deep in sediment. The time lag associated with the cycle of mercury means that it is years or even decades before reductions in anthropogenic releases of mercury have a measurable reduction on mercury contamination. However, an improvement in the future is possible as demonstrated by a recent decrease in mercury levels in the North Atlantic Ocean, thought to be a result of the decrease in emissions from US and Europe over the last decades.²⁹

4.1.9 The major stakeholders

Those who actually do the mining often come from Brazil and both push and pull factors are at play. The push comes from escaping poverty and joblessness in the arid and harsh livelihood situation in rural North-Eastern Brazil. The pull is the desire to strike it rich one day, not unlikely the gold rush to Alaska around 1900. Then there are the middle-men to whom they sell the gold and from whom they often have to buy their machines, fuel and other supplies. An attempt to describe those who control the sector to provide e.g. security guards and who sell to the international market in Suriname is made by Dutch investigative journalist Jeroen Trommelen³⁰. His books points to the highest political level in the country, but it is clear that transparency in the sector is not promoted.

While the international gold price – especially as determined by the London gold market - fluctuates with demand as f.e. induced by confidence or lack of it in the major currencies, the *garimpeiros* will continue with their hopes to find at a given moment the “big bullion” and in the meantime cause great havoc to the local communities, stakeholders in the form of victims, the environment, and though the environment, also stakeholders in the form of victims, but now elsewhere and in the future.

²³ Wip, D. et al. (2013). Urban mercury pollution in the city of Paramaribo. *Air Quality, Atmosphere, and Health*. 6 (2013): 205-213.

²⁴ Lindqvist, O. et al. (1991) Mercury in the Swedish environment—recent research on causes, consequences and corrective methods. *Water, Air, and Soil Pollution* 55.1-2 (1991): xi-261.

²⁵ Hsu, J. (2014). Arctic Bacteria Show Long Evolution in Toxic Mercury Resistance. October 2014. Available at <http://www.astrobio.net/topic/origins/extreme-life/arctic-bacteria-show-long-evolution-toxic-mercury-resistance/>

²⁶ Scheuhammer, A.M., et al. (2007). Effects of environmental methylmercury on the health of wild birds, mammals, and fish. *AMBIO: A Journal of the Human Environment* 36.1 (2007): 12-19.

²⁷ Müller, A.K. et al. (2001). The effect of long-term mercury pollution on the soil microbial community. *FEMS Microbiology Ecology* 36.1 (2001): 11-19.

²⁸ Spiegel, S.J., and Veiga, M.M. (2005). Building capacity in small-scale mining communities: health, ecosystem sustainability, and the Global Mercury Project. *EcoHealth* 2.4 (2005): 361-369.

²⁹ United Nations Environment Program. (2013). Global Mercury Assessment 2013: Sources, emissions, releases and environmental transport. Geneva: UNEP Chemicals Branch (2013).

³⁰ Trommelen, J. (2013). Gowtu – Klopjacht op het Surinaamse Goud. Conserve, ISBN 978 90 5429 3460.

4.1.10 Conclusion

Mercury pollution from ASGM in the Guiana Shield is having a devastating effect on the environment, food chain and human health. The impact of this highly toxic pollutant is apparent on both local and international scales. The only satisfactory solution to prevent further damage to the world's ecosystem is to control the use and release of mercury. Immediate action is necessary because delays will inevitably lead to further degradation and a slower recovery in the future.

4.2 The Minamata Convention

4.2.1 History and content

In 2005 following a decision by the UNEP Governing Council the Global Mercury Partnership was established which recognised the need for a legally binding instrument to ban the further entry of mercury into the environment, on all levels.

After an intensive process of negotiating which started in 2010 in Stockholm, in October 2013 the text of the convention was opened for signing by states and international organisations in the Japanese village of Minamata which had experienced horrific impacts of mercury in the effluent of a local industry on its inhabitants and its environment – see above. Called the 'Minamata Disease', it was decided to name the convention after the village in honour of the victims.

There is wide support for and agreement on the content of the convention and the U.S. after signing has immediately also ratified it.

In January 2013, during the 5th Meeting of the International Negotiating Committee, the Global Environment Facility (GEF) was selected as the financial mechanism for the implementation of the convention. Only countries which have signed the convention are eligible for GEF resources.

A 120 countries now have signed the convention, which will enter into force after 50 countries have ratified. In the light of the description of the pollution problem in the previous section there is a strong feeling to speed up ratification as the urgency of banning mercury is shared universally.

Of the Guiana Shield countries here under consideration, Guyana has joined the U.S. as one of the first Parties.

French Guiana is part of France and thus also part of the EU and one may expect speedy ratification by France.

As of September 2014, Suriname, however, has not yet signed the convention. The gold mining sector here is very problematic, both as to its release of mercury³¹ to the environment of an estimated 20.000 kg per year (!) (see above), and because of its opaque structure.³²

Where does this mercury come from?

The local press reports mercury is easily smuggled from the neighbouring countries into Suriname because of the porousness of the borders, but inspectors in the EU also point to smuggling from EU countries.³³

This maybe in the form of mercury hidden in other goods or as element in dental amalgam, thermometers, barometers, etc. It can be sent as freight and misdeclared, but sometimes the combination with other goods and their relative weights can be an indication for detection.

Smuggling mercury from the EU is a violation of Regulation 1102/2008, to which, if detected, "effective, proportionate and dissuasive penalties" should be applied by the Member States.

An example where a Member State has criminalised contravention of the Regulation is the UK.

The UK Mercury Export and Data (Enforcement) Regulation 2010 No. 265) states that it is an "offence to contravene or fail to comply with any requirement of (amongst others) Art 1 (1) of the EU Regulation concerning the "prohibition on export of mercury from the EU (....)".

If guilty and "on conviction on indictment, a person is liable to a fine or to imprisonment for a term not exceeding two years, or both."

Better compliance with Regulation 1102/2008, as adjusted in the near future to bring it in line with the EU ratification of the Minamata Convention, will require more focus of the responsible authorities, more international cooperation both between EU Member States and with destination countries. Due to vested interests in the gold sector, the latter will be a challenge.

Also, as shipments are small, enforcement is difficult, like it is in the field of drugs smuggling.

³¹ Ouboter, P. Mercury pollution in the aquatic environment of Suriname. Environmental Research Center Anton de Kom University of Suriname. Available at <http://www.nimos.org/smartcms/downloads/Kwik%20vervuiling%20in%20het%20aquaatsch%20milieu%20NIMOS.pdf>

³² Trommelen, J. (2013). Gowtu – Klopjacht op het Surinaamse Goud. Conserve, ISBN 978 90 5429 3460.

³³ Personal communication

4.2.2 The Minamata Convention and ASGM

One of the subjects where Regulation 1102/2008 needs adjustment concerns the Artisanal and Small Scale Gold Mining (ASGM) on which the Convention has a separate article, while the topic is not explicitly addressed by the Regulation.

Article 7 of the Convention does **not** impose an immediate ban on the use of mercury by ASGM, in technical terms “the mining and processing in which mercury amalgamation is used to extract gold from ore”, but it requires that each Party to the convention “shall take steps to reduce, and where feasible eliminate, the use of mercury (...)”

If the ASGM sector is considered to be “more than insignificant” the Party has to develop and implement a National Action Plan to achieve the above. Further details on the structure and elements of these plans are given in the article and in Annex C of the convention.

It has to be noted that no end date is given to have banned the use of mercury in ASGM completely. This reflects of course the position of the countries with (relatively) large ASGM sectors during the negotiations, which have powerful stakeholders in the sector and which might feel not being able to enforce reductions on the short term, let alone an outright ban.

Some have argued that an outright ban would lead to a disappearance of the mercury trade in the black market.

4.2.3 A moral and legal dilemma

Not willing and/or unable to enforce a ban on the use of mercury in the ASGM sector poses a moral and legal dilemma.

The moral dilemma is of course that certain countries, Parties to the convention, are allowed to continue activities which cause irreversible local, national and global harm to health and the environment, compromising the rights of future generations of the community of life to a safe and healthy environment.

Knowingly, a highly toxic ‘global pool’ will be increased in size.

Yes, these Parties have to take steps to reduce the release of mercury, but the how and the when is not specified.

With all the understanding for the individual miners and the communities to which they belong, their activities, if unchecked, create an immoral situation. The world community should join forces from all sectors (buyers of gold, health authorities, toxicologists, the judiciary, police and customs) to stop the release of mercury into the environment.³⁴

It is also a legal dilemma as we do have a globally binding legal instrument addressing one of the most serious threats to health and environment, but addressing one of the most serious sources of these threats is dependent on unspecified measures both as to content and in time.

4.2.4 Role of the EU in assisting Parties with ASGM sectors in the Guiana Shield

Above, the role of the EU as to the export of mercury and mercury compounds (Regulation 1102/2008) was summarised and some first recommendations were given to improve implementation of the regulation.³⁵

An important additional role for the EU is of course assisting those Parties and non-Parties with which the EU has development cooperation programmes, with developing and implementing the National Action Plans to reduce and possibly eliminate the use of mercury.

Looking at the three Guiana Shield countries under consideration in this study, it is a mixed bag: Guyana has already ratified the Minamata Convention, Suriname has not (yet) signed, and French Guiana is part of France and therefore belongs to the EU. Ratification of the convention by both the EU and France is to be expected in the near future.

As Party to the convention and having a ‘non-insignificant’ ASGM sector in its territory, Guyana will have to draw up a National Action Plan, preferably as soon as possible, where the EU can assist both financially and as to substance (think

³⁴ One does not have to be Catholic to fully support this appeal from America: The National Catholic Review: “ Ironically, Mercury, the Roman messenger of the gods, has returned in the 21st century as a danger, one of the most toxic chemicals affecting women, pregnant women, the fetus and the newborn. Why can’t pro-choice, pro-life and other groups concerned with women and children’s health join forces to stop mercury and other toxic 20th-century creations that fly through the air, flow in the waters and find home in the soil?” <http://americamagazine.org/issue/5159/article/polluting-future>

³⁵ A full review of the implementation on both EU and Member State level is foreseen for November 2014 and will provide more specific recommendations.

of sharing research about toxicity and of long-range transports of mercury through air or water, but also in improving customs services – the latter because of local reports of smuggling of mercury from Guyana into Suriname.)

Since Guyana is eligible to GEF resources the EU cooperation programme and the GEF may pool their resources to promote preparing an effective Action Plan.

For Suriname, as non-signatory, it is difficult to assess the political will to come up with an action plan to reduce mercury releases to the environment, but at least the EU should show its willingness to contribute to such a plan.

As French Overseas Territory (OT), upon ratification by France, one may assume that French Guiana will start to take the necessary measures in time.

It is, however, essential to look at these three territories (and neighbouring Brazil) together, as both miners and mercury easily travel from one country to the other. The occasional crackdowns on the miners in French Guiana has driven the miners both to Brazil and Suriname, only to return when the *gendarmerie* has left the mining sites...

Policy (and financial) support for NGOs with a dedicated programme to reduce or stop mercury releases from ASGM sites, such as WWF Guianas, and continued support for the UNDP-coordinated project the Guiana Shield Facility (GSF)³⁶ have been ways for the EU to assist in field level activities where feasible to create awareness among miners about their personal health effects, the damage to the environment and the local and regional fisheries and about technical devices for mercury free mining or for recycling the mercury so it does not enter the environment.

A powerful tool to identify the scope of the problem is the use of Earth Observation by satellites to show the exact location of the various mining sites and thus the sources of the mercury pollution. For the Guiana Shield Facility this has already started as part of its monitoring system FORESEEN (FOrest REMote SENSing Exchange Network).³⁷

Experience has demonstrated the use of these images to foster willingness to discuss problems and to remedy situations, as it becomes difficult to hide illegal activities from the public eye and as public opinion often is a first factor in the process of policy-making.

³⁶ See www.wwfguianas.org and www.guianashield.org

³⁷ FORESEEN is carried out by SARVISION and images of mining sites and their expansion can be seen in their report to the GSF, of 26 November 2013. PDF available upon request. SARVISION is continuing its mapping of the mining sites in the Guiana Shield ecoregion. See note 9

5 Conclusions and Policy Recommendations

In ratifying the Minamata Convention and by, in conjunction, reviewing its Regulation 1102/2008 to ban all exports of mercury, the EU will have strong legal tools at its disposition to play its role to combat what in some Member States is already considered a criminal offence, namely the serious environmental harm caused by mercury pollution.

However, the Convention does not contain provisions to directly decrease and ban the use of mercury in the so-called artisanal and small-scale mining sector (ASGM), but only that Parties with ASGM activities within their boundaries “shall take steps” and, if it is a significant sector, they have to prepare Action Plans. No time-lines are given!

This is a serious deficiency as the risk of man and nature to exposure to the highly toxic substance of mercury will inexorably increase, also of course of EU citizens.

For the EU there are three policy implications following from this deficiency.

The first one, of course is insisting at coming negotiations on the implementation of the convention that time-lines are given and that existing methods of preventing mercury from entering the environment, e.g. the use of retorts to recycle are made obligatory and that countries who refuse to do this are subjected to whatever sanctions which are legally possible. The Minamata convention may have to be amended in this respect.

The second one is that the EU indeed undertakes everything it can to prevent mercury coming from sources within the EU to fall in the hands of the ASGM sector. Regulation 1102/2008 fully banning any export of mercury or mercury compounds to third countries in principle is the right instrument. However, it remains to be seen how effectively the Member States are carrying out the regulation and to what extent they are willing to criminalise violations of the ban, as the UK has done – see above.

As the regulation is currently still under review, this study will have to be adjusted once the review is available.

The third implication lies outside the strictly legal and is grounded in the fact that the EU and its Member States together form the largest collectivity in the world for development cooperation, and in that capacity should assist the countries with significant ASGM sectors to develop operational plans – including initiatives for certification to reduce and in the end eliminate mercury releases as soon as possible, out of self-interest and for future generations.

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