

GOMIAM POLICY BRIEF

GOMIAM is a knowledge network on small-scale gold mining and social conflicts in the Amazon. It is built on interdisciplinary research teams that share a comparative and transboundary perspective in five countries, namely: Suriname, Brazil, Bolivia, Peru and Colombia. Our academic results have been translated into policy recommendations – Policy Briefs. With this series, GOMIAM wishes to bridge the existing research and policy divide, by presenting specific policy problems, related evidence-based research results and implications and recommendations for policy makers.

GOMIAM

BY: GOMIAM-SURINAME



REDUCING MERCURY USE IN THE SMALL-SCALE GOLD MINING REGIONS IN SURINAME

November 2015

This Policy Brief presents the results of a Knowledge, Attitudes and Practices (KAP) study on mercury use among small-scale gold miners in Suriname, commissioned by GOMIAM and WWF Guianas¹. Its primary objective is to give an insight into the knowledge, attitudes and practices of miners with regards to the use of mercury in mining. This information is important when it comes to designing policies that have a lasting effect on the reduction and finally the elimination of mercury use in artisanal and small-scale gold mining in Suriname.

INTRODUCTION

Principal Policy Problem

In Suriname excessive and uncontrolled use and spillage of mercury is taking place. Immediate action from the government and the miners is needed to phase out mercury from the gold mining sector as quickly as possible. Otherwise the long term effects on nature, but especially on the health of human beings will be severe. Small-scale gold miners are in contact with mercury in different stages of the mining process, notably amalgamation, separation of the amalgam, removal of excess mercury and burning the amalgam. Exposure to mercury may cause a wide range of symptoms including chemical bronchiolitis and pneumonitis (from inhalation), and damage to the nervous, digestive and immune systems, as well as the lungs and kidneys. Mercury poisoning can usually not -or only partially- be treated.

In Suriname, the import of mercury requires a license, but there are no additional laws that explicitly mention mercury. Within the government, responsibilities and knowledge about mercury are fragmented among ministries and departments, which obstruct effective policy making and implementation with regard to mercury.

Since the late 1990s, governmental institutions (GMD-Geology and Mining Department; OGS -commission for the regulation of the gold sector) and non-governmental organizations (WWF and PAHO) have executed mercury awareness campaigns among gold miners in Suriname, but so far with limited results. There are several challenges in motivating gold miners to reduce mercury use, such as the lack of mining concession titles for small-scale miners, limited awareness, mobility of gold miners, minimal monitoring and control, and the expenses of equipment for mercury-free mining. In this Policy brief we will give more insights in these challenges and come up with a number of recommendations to reduce and eventually eliminate mercury use in small-scale gold mining in Suriname.



Burning amalgam

Photo: Marjo de Theije

¹See: Heemskerck, M. & Duijves, C. (2014). Gold miners' knowledge, attitudes & practices with regard to mercury. A study in four small-scale gold mining areas in Suriname. <http://www.gomiam.org/wp-content/uploads/2014/10/Social-Solutions-2014-KAP-with-regard-to-mercury.pdf>



A mining pit in the south of Suriname. Photo: Marjo de Theije

Key recommendations

1. Given the popularity of mercury as a cheap, effective and readily available aid to extract gold, policy interventions may be most effective if they initially seek to reduce mercury consumption, rather than immediately aim for the total elimination of mercury use. The **stepwise reduction** of mercury in small-scale gold mining can be a first stage of a broader policy aimed at a complete ban on mercury in small-scale gold mining by a to-be-determined target date.
2. We propose an intervention strategy that addresses a **combination of facilitation** conditions: laws and regulations, the price of mercury, attitude of goldminers, access to alternative techniques, and awareness; they should all be addressed together in an integrated approach.
3. We recommend installing a **cross-sectoral platform** dedicated to reducing and phasing out mercury use in the gold mining sector. This platform should: (a) improve coherence between the activities of different institutions; (b) improve the efficiency and actual outcomes of interventions by governmental and non-government organizations and; (c) strengthen national capacity.

Risk

The Minamata Convention² was adopted in October 2013 and has been signed and/or ratified by 100 countries, including all South American countries except for Suriname³. The Suriname government says that it needs to better prepare the country prior to signing the Convention. The NIMOS Roadmap for Implementation of the Minamata Convention provides a skeleton for such an action plan, but it lacks hard timelines and appointed responsibilities. There is a risk that if no action is taken, Suriname will lose the momentum that is generated by the Minamata Convention⁴. Particularly considering the transboundary nature of mercury contamination, it makes sense to design shared solutions.

METHODOLOGY

The GOMIAM-Suriname team conducts research on small-scale gold mining in Suriname, from a comparative and transboundary perspective. Between 2011 and 2014 several studies were executed amongst small-scale gold miners, policy makers, and other stakeholders involved in the sector⁵. This policy brief is based on the outcomes of a Knowledge, Attitudes and Practices (KAP) study among small-scale gold miners in Suriname, commissioned by GOMIAM and WWF Guianas, executed in 2014⁶. The research methodology consisted of reviewing of existing data about mercury use and contamination related to small-scale gold mining in Suriname and in the Guiana shield region in general. In addition, a survey was carried out with gold miners in three small-scale gold mining regions: Matawai, Brokopondo and Merian. Finally, qualitative interviews were conducted with key professionals and local experts.

² The Minamata Convention is a global treaty that contains guidelines and measures for signatory countries, with the aim to protect human health and the environment from the adverse effects of mercury. It puts special emphasis on international regulation of the informal sector for artisanal and small-scale gold mining. <http://www.mercuryconvention.org/Convention/tabid/3426/Default.aspx>

³ United Nations Environmental Program (2014). Minamata Convention on Mercury Countries. Accessed online 9 August 2014. <http://www.mercuryconvention.org/Countries/tabid/3428/Default.aspx>

⁴ NIMOS (2014). Activities Matrix Mercury Free Environment. Strategy matrix Policy document & Roadmap for Implementation of Minamata Convention. Policy report. Nationaal Instituut voor Milieu en Ontwikkeling Suriname, Paramaribo, Suriname.

⁵ See for example: <http://www.gomiam.org/laws-rules/suriname-2/>

⁶ <http://www.gomiam.org/wp-content/uploads/2014/10/Social-Solutions-2014-KAP-with-regard-to-mercury.pdf>

RESULTS

Regulatory and policy framework

A challenge in regulation of, and control on, mercury use in small-scale gold mining is that knowledge, responsibilities and authority with regard to the mercury issue are fragmented within diverse government offices. The Environment directorate of the Ministry of Labour, Technology and Environment (ATM) is responsible for making, executing and controlling environmental policy, including issues related to mercury. At present there is an Environmental Coordinator within the Cabinet of the President, but it is unclear how the tasks and responsibilities of this coordinator complement or differ from those of the Environment directorate of ATM.

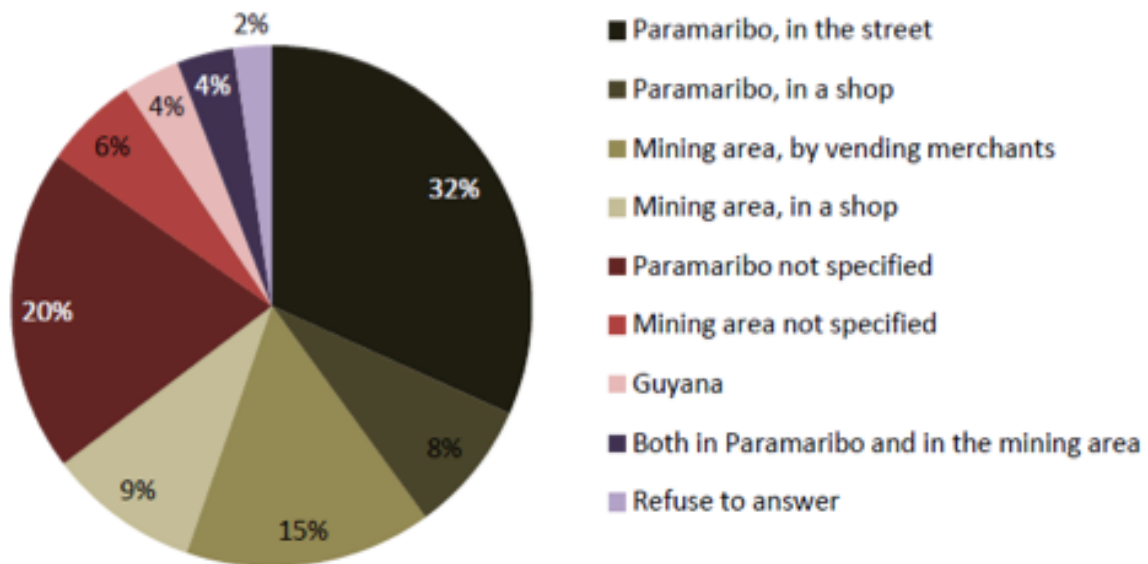
Within the Ministry of ATM, the department for labor inspection has the authority to control labor conditions, including exposure to dangerous substances, and take measures where necessary. As a governmental foundation, NIMOS can advise policy makers but has no authority of execution. The GMD, which sits under the Ministry of Natural Resources, is by law responsible for control for the use of best practices in small-scale gold mining. At this moment however, the GMD is hardly executing any control⁷. The Commission OGS is an executing agency and has a strong controlling function, but does not make policy. In short, there is no central management when it comes to the development, implementation and control on policy to regulate mercury in small-scale gold mining.

Acquisition of mercury

In the government regulation Decision Negative List (Besluit Negatieve Lijst 2003; S.B. 2003 no. 74), which forms part of the law on the transportation of goods (Wet Goederenverkeer; S.B. 2003 no. 58), mercury is listed with the items for which an import license is required. In January of 2013, the head of the department for Import, Export and Currency Control (Invoer, Uitvoer en Deviezencontrole - IUD) of the Ministry of Trade and Industries (Handel en Industrie - HI) stated that no single license for the import of mercury had been granted in the past 20 years⁸. This statement implies that most mercury used by gold miners enters the country illicitly.

From the KAP study it shows however that more than half of respondents⁹ had bought mercury in Paramaribo the last time they had bought it, mostly in the streets. About one third of the gold miners had bought mercury in the mining areas, most often in a shop.

Figure 1: Places where small-scale gold miners last bought mercury (N=85)



⁷ According to B. Paansa, Chief exploration and geology GMD, personal communication dd. 26/05/2014

⁸ Dagblad Suriname (2013). Arun Jadoenath Missier: 'Verboden kwik is op negatieve lijst'. Issue of 22-01-2013. Accessed online 15 July 2014.

⁹ The cleaned survey sample counted 115 Surinamers, 58 Brazilians, and 5 Guyanese.

Amalgamation

Amalgamation is efficient for liberated or partially liberated gold, and for particles coarser than 200 mesh (0.074 mm)¹⁰. Coarse nuggets do not need to be amalgamated; gold miners pick them manually, either with a metal detector or from the concentrate in a gold pan or sluice box.

Almost three quarters of interviewed gold miners reported whole ore amalgamation, where mercury was always or sometimes applied to the unprocessed ore. It is relatively less common to place mercury in the sluice box during the mining process (35% of respondents always or sometimes). Gold miners typically apply mercury in the concentration phase (73% always or sometimes). Almost two-thirds of surveyed gold miners reported covering the gold pan with large leaves to prevent the vapour from escaping into the air. Few gold miners burn the amalgam inside the cooking and/or sleeping hut. Even though 66 percent of gold miners had heard of a retort, only 9 percent reported “always” using this device for burning the gold-mercury amalgam. Of those individuals who had experience with a retort, 83 percent reported that it (had) worked very well. Among those miners who had heard of a retort and were not using one at the moment, the main reasons for not using one were that there was none at the camp and that it took too long to burn the gold, which was felt as a security risk. The fact that gold burned in a retort is hard to break and divide was also mentioned as a disadvantage.

Figure 2: Burning the mercury gold amalgam on a wood fire, with a gas burner or with a retort

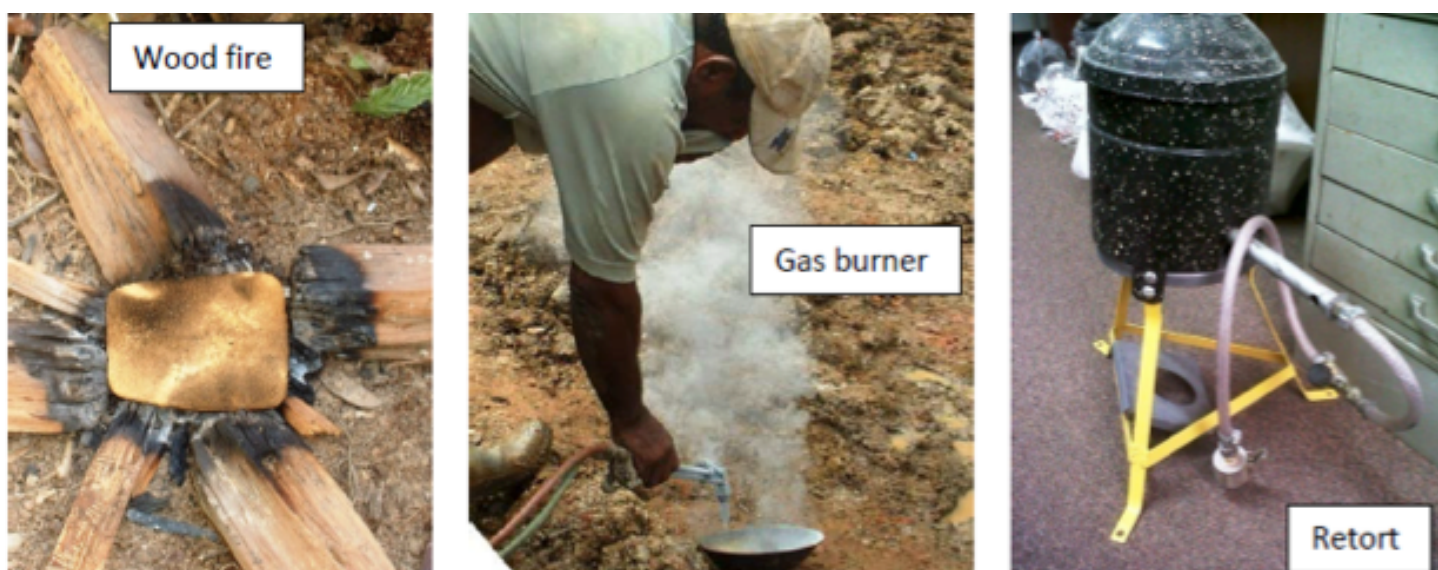
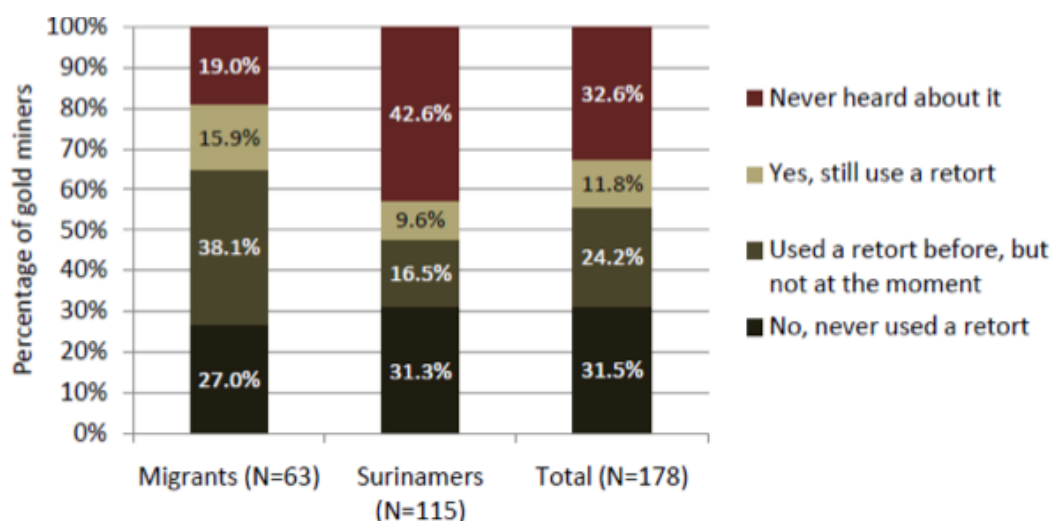


Figure 3: Responses to the question: Have you ever used a retort?



¹⁰ Veiga, M.M., S.M. Metcalf, R. Baker, B. Klein, G. Davis, A. Bamber, S.J. Siegel, and P. Singo (2006). Manual for Training Artisanal and Small-Scale Gold Miners. Global Mercury Project. GEF/UNDP/UNIDO, Vienna, Austria.

Contact with mercury

82 Percent of gold miners in teams working with mercury personally handled mercury. Almost all miners in this group said they had skin contact when doing so; when squeezing excess mercury from the amalgam, washing the sluice box, or when throwing mercury on the unprocessed material. More than half of the surveyed miners indicated that they were concerned about contact with mercury, primarily because of the adverse health effects. Reasons for not being worried about mercury were mostly related to nonchalance, disbelief in the risks, and trust in the efficiency of protection and one's own strength. One out of every five gold miners indicated that they did not protect themselves against contact with mercury. Whereas virtually no gold miners prevented skin contact with mercury, they generally did make a conscious effort to limit contact with the fumes. They mostly covered their nose and mouth with a cloth and nose cap/mask or the hands. Others stayed at a "safe" distance and/or made sure to be out of the wind direction when burning the amalgam. Nearly two out of every five gold miners had never received information about mercury. Gold miners who had received information, had mostly received it from the media or friends and colleagues. Awareness activities from the government and NGOs have been little effective in reaching the majority of gold miners. Topics that gold miners mostly wanted to learn more about included the health effects; how to use mercury wisely; the dangers and impact in general; and how to work without mercury.

Knowledge of environmental and health effects of mercury

When asked how mercury might enter the human body gold miners most often mentioned inhalation of vapours, followed by the consumption of fish and vapour entering the pores. With regard to the fish that tend to have relatively higher mercury levels, most people among those who provided an answer correctly named types of piscivores- though not necessarily for the correct reason. Generally knowledge about the health effects of mercury was suboptimal. One third of gold miners could not name any venue of mercury contamination in people; half of surveyed gold miners did not know what fish generally have relatively higher mercury content; and 89 percent was unable to name any of the effects that can be caused by mercury poisoning. Furthermore, 71 percent of gold miners reported they did not know how mercury can be removed from the body, and those who did provide an answer mostly had it wrong. Gold miners also had a very poor understanding of the dispersion of mercury in the natural environment, and did not think that their use of mercury could affect people in locations beyond the mining area. More than a third of small-scale gold miners did not believe that the health of children could be affected by the use of mercury in a nearby mining area.

Figure 4: Sources from where gold miners had received information about mercury

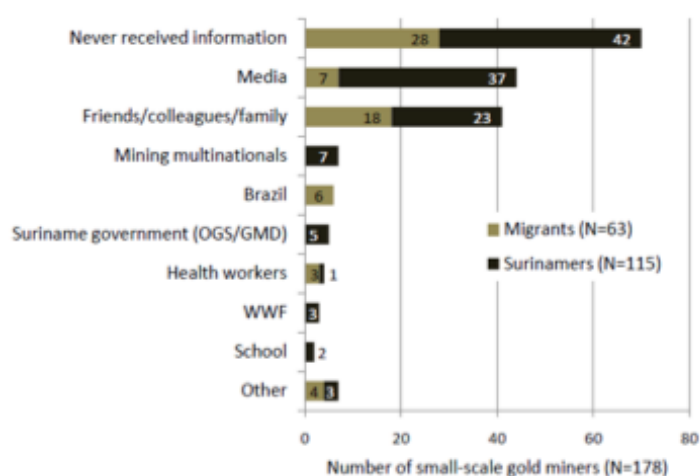
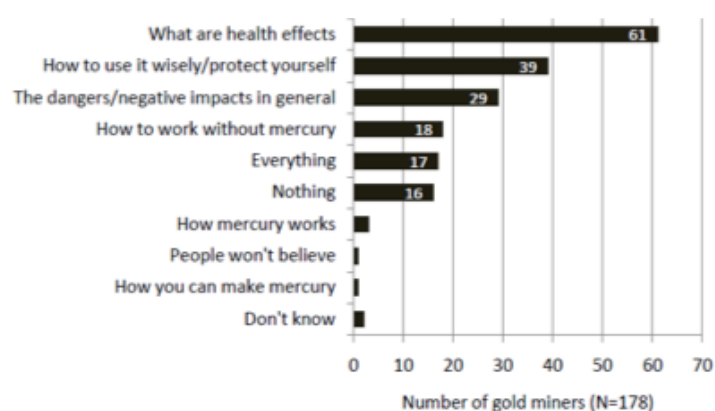


Figure 5: What mercury related topics would you like to learn more about?



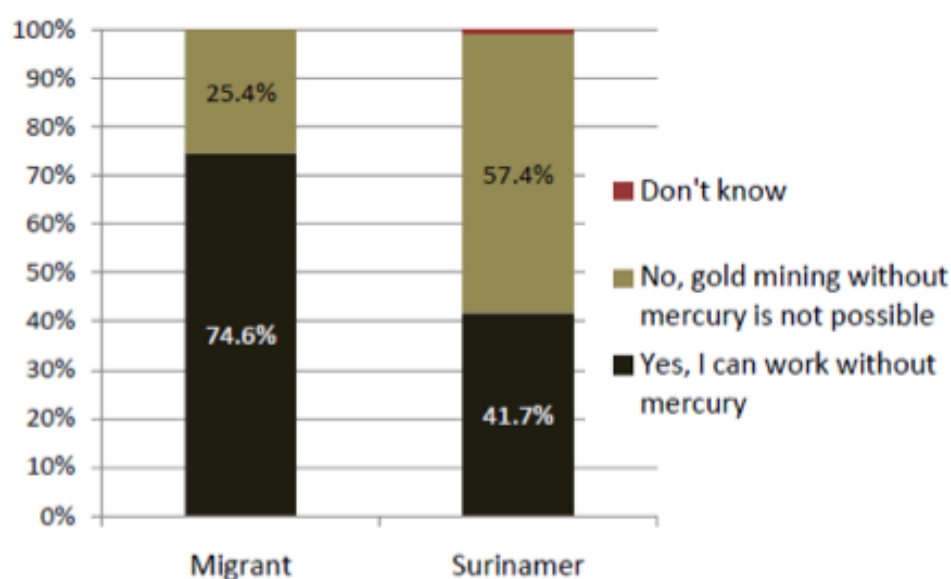
Towards zero mercury-use

If the government were to ban the use of mercury in small-scale gold mining, what would happen? In the opinion of the largest group of gold miners, they would just continue without mercury (table 1). Particularly migrant miners were of the opinion that they would find a way to deal with it. A Brazilian equipment owner explained: "We would just work without mercury, because that is what we did in the olden days. Now we have gotten used to mercury. It is easier with mercury, but it is possible without it." A colleague agreed: "we would just have to adapt." From the KAP study it showed that two third of small-scale gold miners -relatively more migrants- indicated that in their opinion it was possible to work without mercury. Others expected that gold miners would use mercury clandestinely (18%; Ntotal=178). As compared to migrant miners, Suriname gold miners were more likely to expect problems and voiced the opinion that the government was responsible for finding a solution.

Table 1:
Perceptions of gold miners with regard to the possible consequences of a ban on mercury in the small-scale gold mining sector

What do you think would happen if the government would ban mercury from small-scale gold mining?	Migrants (N=63)	Surinamers (N=115)	Total (N=178)
We will just continue without mercury/find another system	20 (31.7%)	16 (13.9%)	36 (20.2%)
Gold miners will continue to use it clandestinely	13 (20.6%)	19 (16.5%)	32 (18%)
Government must find a solution for us/give us machines	0	24 (20.9%)	24 (13.5%)
Many gold miners will quit/we cannot mine without mercury	7 (11.1%)	15 (13%)	22 (12.4%)
It would be difficult to work/find less gold	10 (15.9%)	12 (10.4%)	22 (12.4%)
It will cause problems; unemployment, crime	3 (4.8%)	12 (10.4%)	15 (8.4%)
Would be better for the environment/health	9 (14.3%)	2 (1.7%)	11 (6.2%)
If there is another system it would be good	1 (1.6%)	7 (6.1%)	8 (4.5%)
Don't know	1 (1.6%)	3 (2.6%)	4 (2.2%)
It would be bad for the national economy	1 (1.6%)	2 (1.7%)	3 (1.7%)
Government must find alternative work for us	0	2 (1.7%)	2 (1.1%)
They have to stop the mercury company, than we will stop also	0	1 (0.9%)	1 (0.6%)
Then they should forbid other things as well; cyanide, energy drinks, fake products etc.	0	2 (1.7%)	1 (0.6%)
If it is introduced slowly we can cooperate	0	1 (0.9%)	1 (0.6%)
Then they should control the elite as well; it has to be fair	0	1 (0.9%)	-0.60%
	63 (100%)	115 (100%)	178 (100%)

Figure 6: The vision of miners on the possibility to mine gold without mercury



CONCLUSIONS AND RECOMMENDATIONS

In Suriname, excessive and uncontrolled use and spillage of mercury in gold mining is facilitated by (a) omissions in the regulatory framework, (b) the accessibility of mercury, (c) the widespread practice of whole ore amalgamation, (d) low mercury recycling and (e) suboptimal understanding and awareness of mercury related health risks. The authors pose that improved knowledge and awareness activities aimed at reducing mercury consumption will likely have more impact if they are part of an integrated multi-sectoral policy intervention. It is recommended that the Minamata Convention is ratified and used to guide the development of a widely supported action plan to phase out mercury. The elaborate KAP study that was the basis and starting point of this Policy Brief, advocates working towards a total ban on mercury use in small-scale gold mining in two stages. As a first immediate step, authorities should design, implement and enforce regulations aimed at the reduction of mercury consumption, taking into account the (sometimes defective) knowledge, attitudes and practices of the miners. Two main ways to achieve this would be to stop whole ore amalgamation and increase recycling, among others by creating conditions and incentives to use a retort. The longer term goal, however, should be the total elimination of mercury from the gold mining process. Both equipment owners and concessionaries are to be held responsible for mercury use in their operations and on their concessions. In order to succeed, compliance must be controlled and monitored through active government presence in all mining areas.



Sluice box at the mining camp Kriki Negi in Brokopoondo. Photo: Judith Kolen

The researchers also recommend the delivery of easily digestible and accurate information about the main ways that mercury affects people, the health effects of mercury, and measures to reduce mercury consumption as part of an integrated policy on mercury use in the small-scale gold mining sector. Both the Geology and Mining Department (GMD) and the commission for the regulation of the gold sector (OGS) staff should be trained in the specifics of (reduced) mercury use and its effects, and proactively disperse such information among small-scale gold miners.

The researchers also recommend learning from an collaboration with international (e.g. to Global Mercury Project) and national (e.g. Malaria Program) programs. The listed actions require an integrated approach in line with the Minamata roadmap developed by NIMOS, and supported by awareness activities. In order to reduce fragmentation of responsibilities and knowledge, and in an effort to more effectively prepare the country for signature of the Minamata Convention, the Cabinet of the President has approved the installation of a national mercury platform. The Commission OGS is taking the lead in its formation, and members include NIMOS, the Bureau for Public Health (BOG) and WWF Guianas. The installation of this cross-sectoral platform can provide a strong policy basis to support the mentioned efforts.

For more recommendations, divided into 'quick wins', 'outreach' and 'policy', and for more details presented in the full KAP study, see: [Heemskerk, M. & Duijves, C. \(2014\). Gold miners' knowledge, attitudes & practices with regard to mercury. A study in four small-scale gold mining areas in Suriname.](#)

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COLOFON

E-mail: gomiam@cedla.nl

Web: www.gomiam.org

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