

labeled, “Do Not Open.”

In Mubende and Busia, the appropriate approaches for handling mercury waste are not complied with. This is partly due to absence of clear regulations and policies on the use of mercury by the artisanal gold miners in Uganda. It was, thus, established during the ACCC (2018) study that majority of the sampled miners use open dumping at the site represented by n=103 (35%), followed by those who manage it through burying (28%) and those who dump on the roads (10%). The practice of open dumping of wastes contravenes the Uganda National Environment Principle Waste Management Regulations of 1998. The practice is also contrary to Article 39 of the Constitution of the Republic of Uganda, which calls for a clean and healthy environment for the enjoyment of all Ugandans.

Artisanal gold-miners attributed open dumping of mercury waste to lack of knowledge about better waste management practices. This is not surprising given the fact that no clear trainings and awareness programs have been conducted on handling mercury waste in most of the mining sites in Uganda. The practice of poor management of waste is not only specific to artisanal gold miners in Uganda but this situation seems to be common in many other African countries. For instance, a report by UNEP (1999) on waste management practices in Africa indicates that between 20% and 80% of solid waste in Africa is disposed of by dumping in open spaces, water bodies and surface drains as a result of inadequate infrastructure and lack of awareness about better management practices among the populace. Therefore, the issue of proper waste management, especially, hazardous waste calls for concerted effort among government agencies, private sector, civil society, and development partners to develop waste management infrastructure for handling hazardous waste.

## Conclusions and Recommendations

Uncontrolled use of mercury in Uganda’s artisanal and small-scale gold mining sites, particularly, in Mubende and Busia is aggravated by (a) lack of awareness and trainings on how to use other gold extraction alternatives other than mercury, (b) omissions in the regulatory framework, (c) affordability and accessibility of mercury, and (d) the high cost of other alternatives. Action Coalition on Climate Change (ACCC) and the authors of this Policy Brief believe 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 in Uganda’s ASGM sub-sector. The elaborate ACCC study that was the basis of this Policy Brief provides a list of detailed recommendations – a summary of which is highlighted as follows:

- 1) *There is an urgent need by the Ministry of Energy and Mineral Development to formalize the artisanal and small-scale gold mining in Uganda. Fast-tracking the formulation of new Mining Act and Policy is equally compelling. This is important in regulating the activity of the miners and minimizing the risks involved in the ASGM.*
- 2) *There is an urgent need by NEMA, UNBS, MEMD, CSOs to conduct trainings and awareness programs on mercury use,*

*storage, and management among the artisanal and small-scale gold miners in Mubende, Busia and other artisanal gold-mining sites in Uganda.*

3) *There is a need for government of Uganda through MEMD, Parliament, NEMA and UNBS, URA to domesticate and enforce the Minamata Convention that bans the use of mercury in gold mining.*

4) *For as long as mercury is still in use in Uganda, the problems of its use will still abound. There is, therefore, a need by the Ministry of Energy and Mineral Development and NEMA to identify and promote alternative mercury-free technologies that increase (or, at least, maintain) income for miners and are better for health and the environment protection. Such methods may include; the use of gravity methods, panning and direct smelting (borax) among others.*

5) *The transition period of phasing out mercury use by the artisanal miners in Uganda should be preceded with centralizing the management of mercury waste among the ASGMs by establishing waste management systems, especially, for contaminated waste water, used mercury bottles and tailings. The MEMD, NEMA UNBS should develop the system that is affordable and accessible for the ASGMs. This system has been adopted and has worked well in other jurisdictions such as Ecuador and Mongolia among others.*

6) *For protection of public health, there is urgent need by Ministry of Health, MEMD, NEMA to examine the level of concentration of mercury through laboratory tests of water samples and agricultural soils in selected artisanal gold mining sites in Uganda where mercury is rampantly used so as to come up with proper and lasting solution in pursuit of public health and ensuring a clean and healthy environment.*

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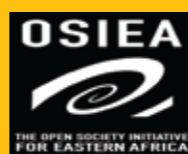
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# POLICY BRIEF ON:

## UNDERSTANDING THE DYNAMICS OF MERCURY - USE IN UGANDA FOR ITS EVENTUAL ELIMINATION IN THE ASGM SUB-SECTOR LESSONS FROM BUSIA AND MUBENDE ARTISANAL GOLD MINING SITE

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The authors of this policy brief are Enock Nimpamya and Julius Ssenyonjo. The policy brief is part of the ACCC project work on promotion of awareness and capacity-building for mercury-free methods and technologies for ASGM in Uganda. It was developed based on a baseline study report on the status and extent of mercury-use by the Artisanal and Small-scale Gold Miners in Busia and Mubende gold mining sites. This and other ACCC publications can be found at the organization's website: [www.accc-ug.org](http://www.accc-ug.org)

## Introduction

This Policy Brief presents the results of the study on **The status, extent, sources, Knowledge, perceptions, storage and disposal practices on mercury-use among small-scale gold miners in Mubende and Busia gold mining sites.** Action Coalition on Climate Change (ACCC) carried out the study with support from the Open Society Initiative for Eastern Africa (OSIEA). The primary objective of this policy brief was to give an insight into the knowledge, perceptions, sources and the extent of mercury-use by the artisanal gold miners in the Mubende and Busia gold mining sites in Uganda. This information is important when it comes to designing policies that have a lasting effect on the reduction and eventual elimination of mercury-use in the artisanal and small-scale gold mining sub-sector.

## Background

Globally, mercury has been ranked the third in the list of toxic substances. It is a toxic substance to ecosystems,

wildlife and human health. In human beings, mercury affects the nervous system and functioning of the brain, especially, of children. Short-term mercury exposure may cause damage to lungs, skin rashes and eyes irritation. In view of the adverse health impacts due to mercury exposure and its impacts on ecosystem and environment and in order to reduce and phase out global mercury-use, the “Minamata Convention on Mercury,” was enacted by over 140 countries in early 2013 and by the end of 2013, up to 94 countries, including Uganda which signed or ratified the convention (UNEP, 2013).

In a baseline study carried out by ACCC (2018) on mercury use in Busia and Mubende, all the sampled artisanal and small-scale gold miners were using mercury without any form of protective gear. In addition, the study established that most of the water sources and soils for agricultural activities in gold mining sites are greatly polluted with mercury beyond national and international thresholds. The ACCC study also pointed out the lack of awareness and trainings in alternative methods and technologies of gold amalgamation among the artisanal gold miners as one of the reasons the ASGMs, almost, exclusively use mercury as opposed to other gold amalgamation methods.

## Principal Policy Problem

As is the case with many other artisanal and small-scale gold mining sites in Uganda, uncontrolled use and spillage of mercury is massively taking place in Busia and Mubende gold mining sites. Immediate action from government and all other stakeholders that include private sector, local area authorities and the miners themselves is needed in order to improve or and phase out mercury-use in the gold mining sector as quickly as possible. Otherwise, the long-term effects of mercury use on environment, wildlife and on the health of human beings will be severe, at least, in the long run. Small-scale gold miners are in contact with mercury at different stages of the mining process, notably, amalgamation, separation of the amalgam, removal of excess mercury and burning of the amalgam. Exposure to mercury may cause a wide range of health effects including damage to the nervous, digestive and immune systems as well as the lungs and kidneys, which in the extreme case leads to death.



**Gold Amalgamation using Mercury:**  
Photo taken by ACCC at Tira gold mining site in Busia District

A review of the existing national laws and policies indicates that although the effects of mercury on environment and human health are dire and widely documented, there seems not to be any attempt at regulating the use of mercury in Uganda's ASGM sub-sector. Even the on-going review of the country's environmental legislation makes no attempt whatsoever to address the issue of mercury use and its associated environmental and health effects.

In terms of incentives and programs available for the reduction in the use of the chemicals by the artisanal gold miners in Uganda, there are already several challenges in the way of motivating artisanal gold miners to reduce mercury use. **These include; limited awareness on effective and alternative gold processing technologies other than the use of mercury, high cost of other available alternatives, availability and affordability of mercury and lack of appropriately gazetted national laws and regulations on mercury-use. In this Policy Brief, more insights in regard to these challenges are given and a number of recommendations for the reduction and eventual elimination of mercury use in Uganda's ASGM sub-sector are highlighted.**

## RESULTS

### Regulatory and policy framework

A challenge in regulation of and control on mercury use in small-scale gold mining is that the sector has for long remained informal. The Mining Act (2003) and the Mining Policy have until today (April, 2018) not addressed the plight of the artisanal and small-scale gold miners in the country. The Location Licenses for Artisanal and Small-Scale Mining provided for under the Mining Regulations, (2004) are obtainable at an application fee of 500,000UGX (equivalent of USD 143) and an annual renewal fee of 250,000UGX (equivalent of USD 71). This seems little money but given the fact that majority of Ugandans live on less than a dollar a day, these fees are considered high to many artisanal miners in Uganda. In a study conducted by COWI in the year 2016 on mercury trade and use for artisanal

miners and small-scale gold mining, it was established that there are only 50 Location Licenses in Uganda and the report concludes that this situation is responsible for the high degree of informality of the sector. It is, however, important to note that the mining legislation in Uganda is currently being revised and it is anticipated that such anomalies will be addressed, including the use of mercury and its eventual elimination in the Artisanal and Small-Scale Gold Mining (ASGM) sub-sector.

The Ministry of Water and Environment, together with the Uganda National Environment Management Authority (NEMA) have the responsibility to formulate and, otherwise, guide parliament in the making of environment-related laws. Therefore, these agencies ought to advise parliament of Uganda to consider addressing the issue of mercury-use in the ASGM sub-sector, especially, in the on-going review process of the National Environment Act.

### Use and Contact with Mercury

Artisanal and small-scale gold miners get into contact with mercury through the different phases of gold extraction, especially, amalgamation. Gold-amalgamation is a concentrating process in which metallic gold is mixed with mercury in a container, drum, or table where the precious metal bonds with the mercury to form a metal-laden mercury amalgam. Amalgamation is efficient for liberated or partially liberated gold, and for particles coarser than 200 mesh (0.074 mm). 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.

*In Mubende and Busia gold mining sites, all the sampled artisanal gold miners (n=204:100%) were using mercury in the gold amalgamation process using bare hands contrary to international guidelines on mercury-use, which require artisanal and small scale gold miners (ASGMs) to always wear gloves whenever dealing with Mercury.*

*Although there are no recent government estimates on the use of mercury in the ASGM sector in Uganda, results of the sampled artisanal gold-miners in Mubende and Busia further indicate that majority of the artisanal gold-miners use an average of 1-50 gms of mercury per person/week. This translates into an estimated amount of 2,800gms per miner/year. Case control studies have shown that chronic exposure via inhalation – even at low concentrations in the range of 0.7–42 µg/m could lead to tremors, impaired cognitive skills and sleep disturbances. In terms of exposure, majority of the artisanal gold miners in Mubende and Busia had by March, 2018 spent between 5 to 29 years using mercury in the artisanal gold mining business as revealed by 56% (n=114) of the sampled miners. Majority of this category were female.*

### Sources and Acquisition of Mercury

Understanding sources and the different dynamics of accessing methyl mercury by the artisanal gold miners is the first step in developing feasible and well-informed remedial measures for the eventual elimination of the chemical in the artisanal gold mining sub-sector of Uganda.

Interviews with leaders of the artisanal gold miners and district leaders in Mubende and Busia revealed that Mercury supply to artisanal gold miners is comprised of; (i) foreign traders of Indian and Chinese origin who bring it in and sell it to the ASGMs through local mercury traders; (ii) local traders who sell mercury to the ASGMs – who in most cases are gold buyers; and (iii) hospital and laboratory officers who smuggle and illegally sell mercury meant for hospital

and laboratory operations to middle men who then deliver it to the ASGMs.

Mercury is typically distributed to artisanal miners in 100gm plastic bottles selling at UGX 2,000 per gram. This translates to USD (\$) 0.6 considering an exchange rate of 3,500 UGX. The plastic bottles are small, un-labeled and in some cases the bottles have labels of other products other than for mercury. This makes mercury affordable and



**A miner in Tira gold-mining site (Busia) holding plastic bottle containing mercury**

### Perceptions and Knowledge on the Use of Mercury

In Mubende and Busia as majority of the artisanal miners (n=140, 69%) revealed that they are not concerned about the current state of mercury use in their specific areas of operation. This is attributed to the lack of concern about the likely negative effects of mercury use, absence of affordable and cheap alternatives compared to mercury and also, the absence of awareness programs on the effects of mercury and trainings on appropriate ways of handling the chemical. 100% of the sampled miners in Mubende and 61% in Busia revealed this. As such, miners have continued to handle mercury with bare hands, which puts their health at risk. A section of artisanal gold miners revealed that use of mercury has affected their skin, irritates their eyes and are experiencing bodily tremors.



**A garden of yams in Tira Gold Mining site, Busia District**



**Children collecting water for domestic use from open surface water well in the middle of a mining site in Kayonza village, Mubende district**

### Knowledge of Environmental and Health effects of Mercury

Concentration of mercury in the environment can create risks on human health. Mere absorption of mercury vapor can be very dangerous and can lead to serious health problems such as lung cancer, skin rashes and eye irritation. Therefore, knowledge of such mercury effects among the artisanal gold miners serves as a repository of hope in such a way that if introduced to mercury-free alternatives and green-economy technologies for gold amalgamation, miners are likely to welcome such programs well knowing the ill effects of mercury.

*During the study by ACCC (2018), majority of the artisanal gold miners (n=118, 58%) in Mubende and Busia expressed fears regarding the health and environmental implications of mercury use in gold extraction. They expressed specific concern over the possibility of polluting food and water resources.*



**A youth miner in Tira mining site, Busia showing how use of mercury has affected his fingers**

Moreover, pregnant women and children below the age of sixteen years old are present at artisanal and small-scale gold mining sites. This was the case at almost all the sampled sites in Mubende and Busia. This is contrary to UNIDO standards and Guidelines on protection of pregnant women and children from mercury pollution. UNIDO standards discourage and prohibit pregnant women and children from accessing sites where mercury is being used.



**A mother breast feeding her child in the middle of a mining site in Kayonza Gold-mining site where she works**

### Factors Influencing Use of Mercury

It was established by ACCC's (2018) study that lack of awareness and skills about the use of other methods other than mercury is the leading reason for use of mercury by the miners in the sampled sites of Busia and Mubende mining sites represented by n=164 (50%). This is followed with the availability and affordability of mercury, high cost of other alternatives and lack of appropriately gazetted national laws and regulations on mercury-use.

Through interviews, it was revealed by the key informants that government had since 2017 through a presidential directive (dated June 28th, 2017) evicted miners from some of the mining sites in Mubende giving mining rights to licensed investors. However, field observation indicated that eviction of miners seems not to be a lasting solution as miners had already acquired other mining sites and the miners in the newly acquired sites are extensively using mercury as ever before.

### Storage of Mercury by the artisanal gold miners

It was discovered that most of the artisanal gold miners in Mubende and Busia store mercury in closed containers (n=118, 40%), which they either keep at home (n=109, 37%) or at the site (n=57, 20%). It should, however, be noted that keeping mercury at home is contrary to UNIDO requirements that prohibit artisanal miners from storing mercury in a domestic residence, or, making mercury accessible to children. This further justifies the urgent need for artisanal gold miners to undergo trainings and awareness about alternative mercury-free technologies or, otherwise, conduct massive awareness programs on the use, storage and general management of mercury – for as long as mercury is still under unregulated use by the artisanal miners in Uganda.

### Existing Management Practices of Mercury waste

International best practices require that contaminated mercury waste should be sealed in plastic bags inside a second plastic bag sealed with duct tape and a label, "mercury-hazardous waste" affixed, or as directed by local authorities. The mercury container or bag should, then, be