

2018

Mercury Trade and Supply in ASGM Hotspots: Kenya Country Situation Report



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Acknowledgement

Centre for Environment Justice and Development (CEJAD) would like to acknowledge the financial support provided by IPEN for the study. Special thanks also go to Yuyun Ismawati, IPEN lead for ASM/Mining, Lee Bell, Mercury policy advisor, Bjorn Beeler, IPEN International Coordinator, and Laura Vyda, IPEN Communications Director, for their technical support and valuable inputs during the project implementation.

Our sincere gratitude also goes to the Ministry of Environment and Forestry, the Minamata Convention Focal Point in Kenya and Multilateral Environment Agreements (MEAs) directorate team, Mr. Richard Mwendandu, Director and Mr. Francis Kihumba, Projects Advisor.

We sincerely thank and express our gratitude to CEJAD board and staff, who tirelessly worked hard to ensure success of the project.

Acronyms

ASGM	Artisanal and Small Scale Gold Mining
BATs	Best Available Technologies
COP	Conference of the Parties
Chemobs	Environment Observatories and Legal and Institutional strengthening for the Sound Management of Chemicals in Africa project
DFID	Department for International Development of the United Kingdom
EMCA	Environmental Management and Coordination Act
GEF	Global Environment Facility
GoK	Government of Kenya
IMKA	Integrated Sound Management of Mercury in Kenya's ASGM
KAM	Kenya Association of Manufacturers
KEBS	Kenya Bureau of Standards
KEMRI	Kenya Medical Research Institute
KRA	Kenya Revenue Authority
ME&F	Ministry of Environment and Forestry
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USD	United States Dollar
WHO	World Health Organization

Executive Summary

Introduction

Centre for Environment Justice and Development (CEJAD) with support from IPEN conducted a study to establish mercury use, trade and supply within the ASGM subsector in Kenya. The study methodology entailed literature reviews; key informant interviews as well as survey of some of the miners in select mines in Siaya and Migori Counties. The main objective of the study was to assess mercury trade and supply chains in the target ASGM hotspots in Kenya.

Key Findings:

Source of mercury: Mercury at mine site is provided by owners of sluices. The owners buy the mercury from dealers found in the major towns (Migori and Kisumu). Most of the dealers in mercury are also engaged in the gold trade business, while some operate shops that also sell other household goods. Some of them operate virtually moving from mine site to another in search of markets. The local dealers get their mercury from Nairobi, with sources indicating that mercury is imported from China, Tanzania.

Quantity of mercury: Mercury can be bought in large quantities in 34 & 35kg metallic containers, before its retailed in weights of 1kg, ½ kg, ¼ kg and in soda bottle tops (locally known as *cork*) usually of between 1- 3 bottles tops. Most miners don't store, but buy small quantities for use at any particular time.

Pricing: 1 Kg of mercury trades between Ksh 10,000 and 22,000 (approximately USD 100 and 220) and can sometimes go up to Ksh 40,000 (approximately USD 400) when the supply is very low. ½ Kg goes for between Ksh 8000 – 11,000 (USD 80- 110) while ¼ kg goes for between Ksh 4500-5000 (USD 45-50). On the other hand, 1 cork (bottle top) of mercury trades between Ksh 1000-1500 (USD 10-15). Study revealed that mercury bought from smugglers especially those not having shops is usually cheaper than those obtained from dealers owning shops.

Networks of mercury supply and trade: According to United Nations International Trade Statistics Database (UN Comtrade), Mercury has been imported into the country from countries such as Germany, China and India having imported 38001, 18121 & 12175 Kilograms respectively in the past 10 years. It is suspected that the bulk of it is smuggled thus lack of accurate data on actual imports and use in ASGM.

Alternative to mercury: Retort was piloted in one of the sites as a safe practice for mercury use. However, uptake remained very low due to perception that it adds impurities to the gold thus fetching low values. There are plans to pilot shaker table by

one of the mining groups in Migori County. In the absence of alternative efficient and affordable technology, mercury remains the dominant option of gold extraction.

Perception about mercury: Majority of miners doing amalgamation who were surveyed believes that mercury is dangerous or harmful to their health and environment but has however not experienced any symptoms associated with mercury use. Some respondents confessed having learnt of the harmful effects through workshops attended while others also learnt of its harmful effects through other people.

Gender Aspects: A clear division of labor exists in the mining camps, with women dominating sluicing, amalgamation and amalgam roasting. Roasting is largely done in small makeshift structures within the mine sites, thus higher risk of inhaling the vapor. Therefore, the division of labour in the mines shows that women interact more with mercury thus higher exposure.

Health Impacts: studies by CEJAD confirms cases of mercury poisoning among women, as over 50% of sampled women of childbearing age showed higher levels of mercury in blood above 1ppm

Interventions: there have been concerted efforts by organizations such as CEJAD to raise awareness on health and environmental impacts of mercury use in ASGM. The government of Kenya is also in the process of formulating National Action Plan for ASGM that addresses issues of mercury.

Conclusion and Recommendations

Mercury use remains common in all ASGM sites despite the health and environmental risks associated with it. Enforcement and control of mercury use is challenged by inadequate personnel, lack of information on actual quantities and sources of mercury, as well as low levels of awareness on mercury use in ASGM among key government agencies.

This calls for the following interventions:

- **Strengthen regulations and compliance monitoring to control illegal mercury supply and trade in ASGM** –government agencies especially those responsible for border control and entry of illegal products need to proactively enforce regulations and continuously monitor illegal mercury entry into Kenya and the supply chains to the ASGM sector
- **Education and Awareness:** targeting ASGM miners on safe mining practices and dangers of mercury use. Targeting government agencies with focus on provisions within the Minamata conventions and their role in its implementation especially on control of illegal mercury supply and trade in the ASGM sector

- **Technology:** Avail affordable, safe and practical technologies to ASGM actors to show that they can get better yields without using mercury
- **Formalization:** Most ASGM activities are still informal thus challenges in piloting interventions such as access to financing and alternative mercury free technologies still exist.

Contents

1. Introduction.....	7
1.1. Objectives	8
1.2. Methodology.....	8
2. Overview of ASGM sector in Kenya.....	9
2.1 Background	9
2.2. Organization of ASGM.....	10
2.3. Scale of ASGM	11
2.4. Nature of ASGM	12
2.5. Mercury Use in ASGM	12
2.6 Storage, Recovery and recycling	13
2.8 Environmental and Human Effects	13
3. Mercury supply, trade and use in ASGM hotspots in KENYA.....	15
3.1. Source of Mercury in the Country.....	15
4. Mercury abatement/mitigation, remediation and rehabilitation issues.....	17
5. Awareness level.....	18
6. Project Outcomes (ASGM and Hg trade).....	19
6.1. Describe the activity conducted within this project framework.	19
6.2 Intentional information/message to be transmitted/delivered.....	20
6.4 Engagement of and impact on Target Groups:.....	20
6.5. Impact on target policies.....	21
6.6. Outreach to Stakeholders:	22
6.7. Deliverables, outputs and/or products:	23
6.8 Communication Efforts:	23
6.9 Communication with National or Local Authorities:.....	23
7. Conclusions and Recommendations	24
7.2. Recommendations.....	Error! Bookmark not defined.
8. References	25
9. Annexes.....	26

1. Introduction

Mercury is a heavy metal occurring on earth in (3) three chemical forms: elemental or metallic mercury (Hg⁰), inorganic mercury (mercurous (Hg²⁺) and mercuric (Hg²⁺) cations) and organic mercury (with at least one carbon bonded to a mercury atom). Mercury can be converted from one form to another by natural processes, and, once released, actively cycles in the environment for hundreds to thousands of years before being buried in sediment. Release is through natural processes as well as anthropogenic sources.

According to the Global Mercury Assessment, 2013 report¹, artisanal and small-scale gold mining (ASGM) is the largest source of anthropogenic mercury emissions (37%), followed closely by coal combustion (24%). Other large sources of emissions are non-ferrous metals production and cement production.

Mercury is highly toxic, and can cause significant harm to both human and ecosystem health. There is no known safe exposure level to mercury, which at high level can cause irreversible neurological and health damage. According to Pacyna et al 2016, mercury has been linked to harmful effects on the cardiovascular, immune, and reproductive systems. Methyl mercury has the ability to pass through the placenta and the blood–brain barrier, thus exposure of women of childbearing age to methyl mercury is of greatest concern (*ibid*). Therefore unborn children and babies are the most vulnerable, along with populations who eat fish contaminated with mercury, those who use mercury at work, and people who live near a source of mercury pollution where the dangerous heavy metal tends to accumulate. The toxicity of mercury to humans and environment has been a subject of key concerns, and the reason behind formulation of a global legally binding instrument; the Minamata Convention on Mercury by the United Nations. The convention aims at addressing all risks caused by mercury. As at September 2018, the convention already had 98 parties who have ratified it.

The convention calls on parties to commit to reduce anthropogenic emissions and releases of mercury and mercury compounds to the environment, covering the entire life-cycle of mercury through several provisions prescribed in the articles. Of key importance is to address the aspects of mercury mining, use, and its movements (trade and supply)

ASGM is key to addressing the environmental and human risks posed by mercury use, being the largest anthropogenic source of mercury emissions it's against this background that, Centre for Environment Justice and Development (CEJAD) with support from IPEN conducted a study to establish mercury use, trade and supply within the ASGM subsector in Kenya. CEJAD has been working with ASGM communities in Migori, Siaya and Kakamega counties. These counties have the largest concentration of Artisanal and small scale gold miners in Kenya.

¹ United Nations Environment Programme, [Global Mercury Assessment](#), 2013

1.1. Objectives

The specific objectives of the project were:

1. To assess mercury trade and supply chains in the target ASGM hotspots in Kenya.
2. To promote the participation of women working in ASGM in policy lobbying to eliminate women's and environmental exposure to mercury pollution.
3. Contribute to the development of the National Action Plan on ASGM for Kenya.

1.2. Methodology

The study was undertaken by in-house personnel at CEJAD. The study focus was to determine the mercury flow (formal to informal markets), linkages and networks as well as actors involved in the supply chain in the ASGM hotspots in the county of Migori and Siaya.

Primary information on illegal mercury trade and supply in ASGM sites was collected from Osiri mining site in Migori County, South Western Kenya and Wagusu mining site in Siaya County. The data was supplemented with secondary information from various reports and online sources.

Data was collected through:

- *Literature review*: Available reports on baseline data/inventory of mercury and mercury products, as well as reports on mercury and mercury product uses and releases.
- *Survey tools*: Semi-structured questionnaires were prepared for primary data collection from the identified sectors. The tools were administered by two miner representatives who were selected as enumerators, from the two sites of Osiri and Wagusu sites.
- *Observations*: observation checklist and use of photography was used in data collection

2. Overview of ASGM sector in Kenya

2.1 Background

Gold in Kenya is mainly found in the geological formations of the Migori Greenstone belt and the Busia-Kakamega Greenstone Belt forming part of the Nyanzian and Kavirondian precambrian rocks. The two form part of the gold-enriched Archaean Tanzanian craton. The belt is known to have metallic mineralization of base and precious metals such as gold, copper and silver.

Figure 1 Geology Map of Kenya

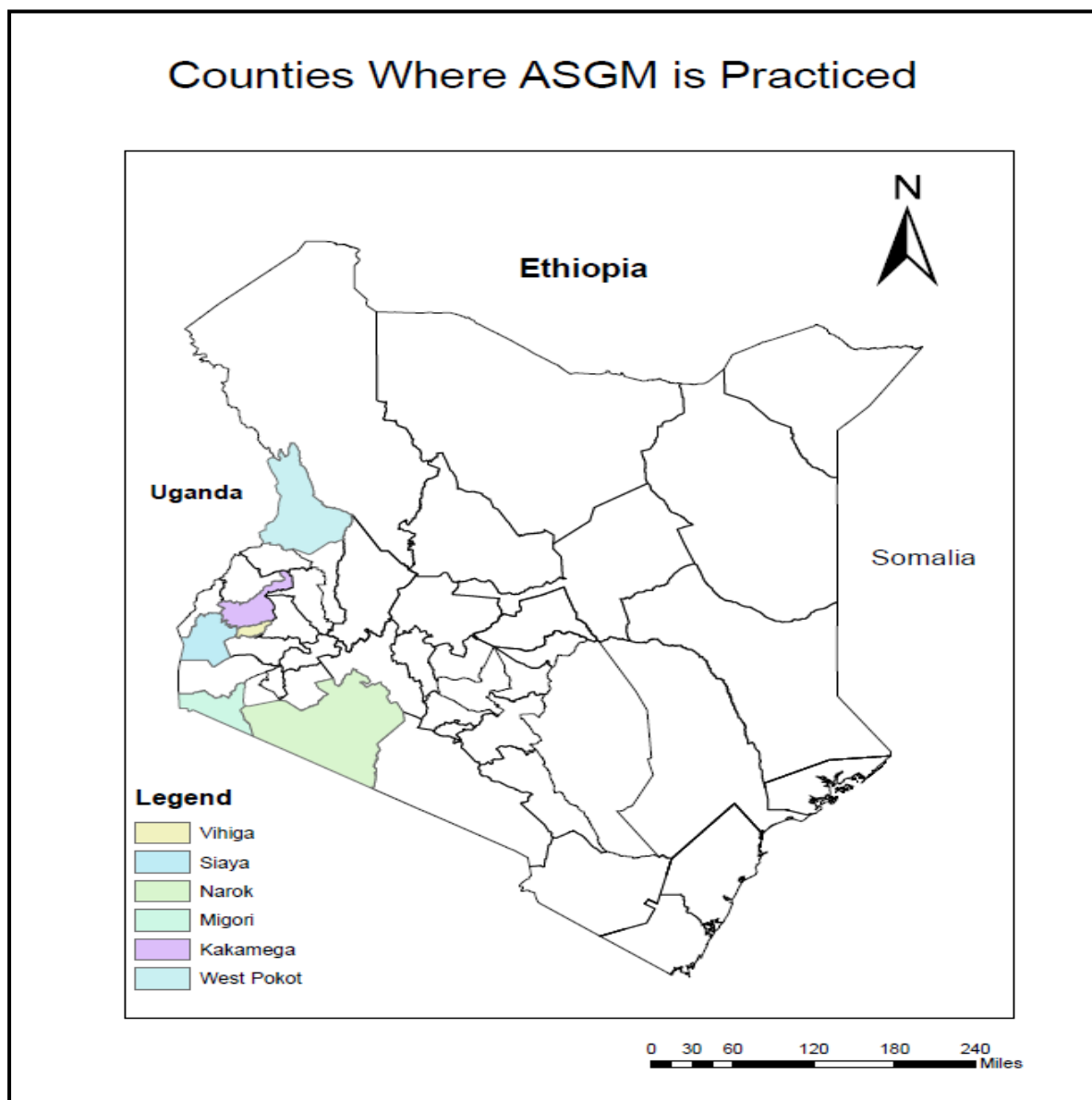


Source: Republic of Kenya (1969), *Geology and Mineral resources of Kenya*

Gold mining in this belt traces back to the 1920s during which period large scale mining of gold was undertaken in Macalder, Kilimapesa and Rosterman areas. Gradual decline of production in the late 1950s to late 60s, so the exit of the large companies and the closure of mines such as Macalder, the largest in the country (GoK 1969).

Artisanal and small scale miners moved into the abandoned gold mines, and the numbers have grown significantly the past two decades due to a renewed sense of Gold rush elicited by new discoveries of Gold estimated to be worth millions of dollars. ASGM is therefore prevalent in counties lying within the gold belt, i.e. Migori, Siaya, Vihiga, Narok, West Pokot, and Kakamega Counties. In Migori County, ASGM is prominent in Masara, Macalder, Masaba, Kitere, Kamwango (Rongo), Kehancha and at the Kuria-Transmara border, In Siaya ASGM takes place majorly in Wagusu in Bondo and Ligega in Ugenya sub counties and Kakamega ounties, ASGM is prominent in Ikolomani and Lurambi (Rosterman area).

Figure 2 ASGM Counties in Kenya



Source: Author

2.2. Organization of ASGM

ASGM is well organized and structured in all the mining sites. Artisanal mining sites are generally managed by pit bosses or in some cases land lords. The extraction itself is often organised through teams of several diggers who cooperate in one pit.

Underground mining is the most common where pits are dug vertically into the ground with various horizontal pits following the reefs being constructed below the surface.

The process is well mechanised with equipment such as compressors, heavy duty water pumps being used. Blasting is periodically done to make it easier to access the reefs. The ore is then brought to the surface by a team of porters for crushing.

Crushing is done using ball mill hammers that are found within the mining sites, operated by few investors who charge a fee for crushing the ore. The crushed ore is then taken through sluices to trap the gold and reduce the amount of ore that goes to panning and amalgamation phase.

Clear division of labour and separation of roles is evident at each mining site. The Women and Children are mostly in charge of sluicing, panning and amalgamation, while men do the manual work such as actual ore extraction and porting. Women are considered as better skilled in sluicing of ore and in amalgamation using mercury, thus their domination in such tasks. In each site tens of women work as casuals in the mines daily performing such tasks, at an average pay of Ksh 200 (USD 2) per sack of ore processed.

The past two years has seen women build up their stake in some mining sites by investing in sluices, as well as ball mill crushers. A new trend is also emerging where amalgam burning and weighing of Gold in the buying centres is being dominated by women. Gold buyers have set up small booths around the mines, where roasting and weighing of gold is done prior to payment for the same. These booths are largely manned by women. The bulk of the women are young ladies so as to attract more people to deliver their gold to the specific buying centres.

Labour mobility is high across the mining sectors, with some level of free entry into the system. However, each site has a boss who is generally aware of the activities ongoing through the site, and is also involved to some extent in vetting of people coming into the mining site investment/employment. The employment terms are generally informal in nature with most workers being semi-independent and working as casuals.

2.3. Scale of ASGM

There are no official statistics on number of people involved in ASGM activities. However, the numbers are estimated at hundreds of thousands. A study carried out by PACT with Support from DFID² in OSIRI Gold mining in Migori found that 70% of the residents in the area are involved in ASGM directly or indirectly. The numbers are estimated at over 100,000 workers around the mines during peak period. Other studies carried out by CEJAD in Siaya and Kakamega counties also revealed that in some Mining locations, almost all the residents are involved directly or indirectly in ASGM activities. The table below summarises some of the figures in 6 mining sites that were sampled.

² Maria B, Patrick S et al 2018, Understanding the Economic Contribution of Small Scale Mining in East Africa; Kenya, Uganda, Rwanda.

Table 1: Total No of Miners at Mining Sites

county	sub county	Mine site	Total miners.	Men	women
Siaya	Ugenya	Ligega	3000	1800	1200
	Bondo	Wagusu	7000	1500	1500
Kakamega	Kakamega Central	Roasterman	4325	2942	1383
	Kakamega South	Mutao	460	260	200
	Kakamega south	Musire	432	423	9
	Kakamega south	Shikoye	40	38	2

2.4. Nature of ASGM

ASGM sector has been on an upward trend fuelled by renewed discoveries of Gold in the region, amidst a declining agricultural sector and limited formal employment opportunities. The last decade has seen renewed interest by large scale mining companies who have announced discoveries of huge commercial gold deposits in Kakamega, and transmara counties. In Kakamega County alone, the estimated value of Gold by the Acacia mining company is quoted at USD 1.65billion³. This has further attracted more people to the sector. The sector looks attractive due to the perceived higher returns compared to traditional livelihood options such as subsistence farming. Mining is also seasonal in nature, the peak season being when a mine location hits a productive reef, thus attracting a large number of miners in the region. The mining population is therefore highly mobile across the different mining sites scattered within the gold belt.

Prior to the new mining Act No. 12 of 2016, all artisanal mining activities were illegal. However, the new act has provision for licencing of artisanal, small scale and large scale mining operations. Despite the new act, artisanal mining remains largely informal, as most mining groups are yet to get the relevant permits and licences. Some groups and individuals have initiated the process of registration and acquisition of relevant licences, while the bulk remains informal and technically illegal. Key challenge to formalisation will remain to be the land ownership dynamics as well as the high mobility within the mines.

2.5. Mercury Use in ASGM

Mercury is used in amalgamation process in all the ASGM sites in western Kenya. Whole ore amalgamation is rarely practiced due to adoption of sluices in the region thus reducing the quantity of mercury used. Overall, the responsibility for providing mercury used in amalgamation lies with the owner of the sluice. Studies by CEJAD established that on average 5ml of mercury yields 10gms of Gold from 1 sack (Long one) carrying an average of 25kg of ore.

The mercury is sold and supplied by specific dealers to the owners of sluices at an average cost of Ksh 18,000 to Ksh 22,000 (USD 180-220). For those who can afford to buy in bulk, it's available at a retail price of Ksh1500 - Ksh 2000 (15-20usd) per 5 ml (1

³ Standard newspaper 28th Feb 2017

cork). The price of mercury fluctuates depending on demand, location and quantities bought. In Nairobi it is reported that mercury is bought between Kshs. 16,000 to 18,000 (Usd 160-180).

2.6 Storage, Recovery and recycling

Recovery and recycling of mercury is common in all the mining sites due to the quantities of Gold recoverable. During panning, mercury that has not been utilised in capturing gold is normally recovered and stored for re-use. The mercury is purified using nitric acid and stored. The process is repeated until the mercury is fully utilised.

Mercury is mostly stored in plastic bottles of different sizes depending on the quantities involved. For large quantities, mercury is bought in 54.5kg metallic cans, then distributed in 1kg plastic bottles resembling the 250ml syrup medicine bottles and portioned into smaller plastic bags or soda bottle caps “cork” further down the supply chain.



Photo 1 & 2: 250ml bottles where mercury and picture of large bottle of mercury
Photo credit/CEJAD

2.8 Environmental and Human Effects of Mercury

There are no publicly available data on health impacts of mercury in Kenya. This is due to the fact that mercury monitoring is not a routine practice in most government facilities, thus the need for mercury blood load monitoring in high risk populations. However, from a vulnerability assessment perspective, the high risk population includes women working in buying centers where amalgam is roasted in a tiny confined environment, women working in sluices and panning, as well as households where amalgam is roasted inside the house. Considering the fact that mercury is used in all sites for amalgamation, the vulnerability of women of child bearing age to mercury pollution cannot be ignored.

In a study conducted by CEJAD, most women of child bearing age sampled had high mercury levels in their blood and some of them had started experiencing symptoms such as shaking of the hands. (<http://cejadkenya.org/new-study-reveals-dangerous-levels-of-mercury-in-women-of-childbearing-age-across-global-regions/>). One case of a woman displaying symptoms of the minamata disease was particularly highlighted, and the woman subjected to treatment for the same.

The women are vulnerable to mercury pollution since they interact with the toxic chemical on a daily basis yet earn very little from it. Roasting of the amalgam (mixture of gold and mercury) is also dominated by women. Amalgam burning is done in small booths acting as the gold buying centers. The small nature of the rooms means that these women of child bearing age are more exposed to mercury vapors during the roasting process.

Poor handling of mercury at the mining sites have been blamed for environmental poisoning in the region. Various studies carried out in the Migori–Transmara region have revealed high levels of Mercury contamination in soils, water bodies, and plant matter. High mercury contents have been quantified in soil, sediment and tailings in the Migori–Transmara gold mining areas. A study by Odumo et al 2014⁴, revealed a mean Hg concentration of 140 $\mu\text{g kg}^{-1}$. Concentration in soils ranged between 20 and 1,100 $\mu\text{g kg}^{-1}$. In the Migori–Transmara area, this critical value is exceeded in five plots (5 % of samples) and only 14 plots showed values higher than 200 $\mu\text{g kg}^{-1}$. Mercury concentrations in the sediments collected from the bottom of rivers ranged from 30 to 2,380 $\mu\text{g kg}^{-1}$ (Table 1), with the lowest and the highest levels recorded from the Migori River and the Lolgorien River.

⁴ Odumo OB, Mustapha AO, Patel JP, Angeyo HK (2011) Multielemental analysis of Migori (Southwestern Kenya) artisanal gold mine ores and sediments by EDX-ray fluorescence technique: implications of occupational exposure and environmental impact. Bull Environ Contam Toxicol 86:484–489

3. Mercury supply, trade and use in ASGM hotspots in Kenya

A study conducted by World Bank⁵ (2016) in Sub Saharan Africa on Mercury trade and use for Artisanal and Small-Scale Gold Mining in Sub-Saharan Africa established that mercury is distributed through informal value chains and smuggled across porous borders in small quantities that are difficult to control.

From the survey and interviews in the mining sites, it was established that mercury is majorly provided by Gold buyers who have set up shop in the regions. The trade and supply is such that there are bulk suppliers majorly in Nairobi, who sell to Gold buyers who in turn supply to the miners who sell Gold to them. The other arrangement is where mercury dealers supply directly to sluice owners, who have the option of retailing in small quantities to other miners as shown in the pictures above and in the annex.

The supply chain consist of the following key actors

- **Bulk gold traders-** who sell smuggled mercury to large scale gold buyers who sell to others.
- **Gold buyers** -who provide mercury to the women amalgamation on different arrangements such as on credit or benefit from the tailings.
- **Middle men** - mercury sellers who practice site to site selling mercury.
- **Chinese traders** – Information from the field has it that they sell mercury from their camps and no one knows where they source it from.
- **Malls and stores**– middle men source their mercury from malls and stores especially in Migori town owned by people with Asian origin.
- The final buyers of the mercury are either the artisanal miners themselves or sluice owners who buy mercury and supply/give to the people working for them as amalgamators.

3.1. Source of Mercury in the Country

Regarding the source, there are mixed information. Some of the dealers claim to buy the Gold from traders of Asian origin, some claim to import from China, while others claim that they get it from across the border (Uganda and Tanzania).

Kenya does not mine mercury. It imports mercury element and products with mercury. Import data from Kenya revenue authority shows that 21,926 Kgs of mercury was imported into the country in the year 2014/15a as shown in the table below

Table 2 Mercury Import Data 2014/15

Product	Quantities (Kgs)
Industrial Mercury	3,087

⁵ <http://web.unep.org/globalmercurypartnership/mercury-trade-and-use-artisanal-and-small-scale-gold-mining-sub-saharan-africa>

Mercury Metal	14,737
Mercury (unspecified)	4,102
Total	21,926

Source KRA import database

According to UN Comtrade database, Kenya did not report mercury imports from 2014 to 2016; however exporting countries such as Singapore, India, Mexico and china have reported exporting mercury to Kenya for all these years. Data from Comtrade reveal that several countries have exported mercury to Kenya as detailed in table below.

Table 3 Comtrade Data showing Mercury Export to Kenya in Kgs

Country	2003	2004	2005	2006	2007	2008	2009	2010	2013	2017	Total
Switzerland	2						2		5175		5179
Netherlands	2070										2070
Germany	2760			4140	6767	8044	4814	10611	863	2	38001
Areas		5659									5659
Spain			29	1787	862						2678
Japan			4140								4140
China			13800			863		1726	1725	7	18121
India			9840				2	7	1620	706	12175
Singapore				2415						3036	5451
Viet Nam										863	863
Mexico									3450		3450
Seychelles									1725		1725
USA					46	3450		1725	112		5333
South Africa								1			1
United Kingdom				6				8			14
Kazakhstan							1656				1656
Russian Federation							1656				1656

Austria				5							5
Total											108,177

The data shows that since 2003 Kenya has imported over 100.8 tonnes of mercury into the country, the bulk of it being from Germany, China and India (38001, 18121 & 12175 kgs respectively). The data also shows import from the East Africa countries of Tanzania, Uganda and Rwanda. However, there is inconsistency in the reporting as can be seen below, whereby no reports were provided between 2013 and 2017. Moreover, Kenya did not report either on the imports.

Table 4 Comtrade Data on Mercury Exports from East Africa Countries (in Kgs)

country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2012
Tanzania				1500		10		2	30			
Uganda	42		125				20		78			1
Rwanda								66			30	

Mercury is a controlled substance in Kenya meaning that it requires various licenses for handling and management. It was obvious that at the site the people handling or dealing with mercury did not have the requisite licenses. It was not possible to ascertain if the bulk mercury traders have the licenses since we did not have an opportunity to interact with them.

During the study it was established that the dealers do not sell mercury to unfamiliar buyers. They only sell to those they trust and have done business with before or introduced by an insider and recommended. This means that the activity is largely illegal thus the need to work based on trust in the absence of proper legal documentation.

4. Mercury abatement/mitigation, remediation and rehabilitation issues

In all ASGM sites, the primary mode of gold extraction is mercury. The ASGM actors claim that they have no access to viable alternatives to gold extractions. Technologies such as retort and shaker tables were completely absent in the sites visited in Siaya County. Roasting is done using charcoal and in some few instances, using gas stove.

In Migori County, some groups have access to retorts. However the uptake and use has remained low as it is said that retort compromises the quality of Gold by contaminating it with impurities. The use of cyanide for leaching is quickly being adopted as more investors who are interested in tailings set up leaching plants across the region.

Several stakeholders including UNDP and Jomo Kenyatta University are undertaking studies on alternative Gold extraction methods so as to address the issue of mercury use in the regions. In this line, the government through the Ministry of Environment and Forestry is in the process of preparing a National Mercury Action Plan. Key highlights of the plan include:

1. Setting National objectives and reduction targets for mercury added products
2. Establishing baseline status of mercury, mercury pollution, and mercury waste stockpiles
3. Putting in place measures targeting the ASGM sector, to ensure:
 - a. Formalization or regulation of the artisanal and small-scale gold mining sector;
 - b. Access to technologies to reduce reliance on mercury
 - c. Steps to reduce exposure by vulnerable populations
 - d. Steps to enhance access to information within the ASGM sector
 - e. A public health strategy on the exposure of artisanal and small-scale gold miners and their communities to mercury. Such a strategy should include, inter alia, the gathering of health data, training for health-care workers and awareness-raising through health facilities;

The action plan has provisions for civil society engagement in its implementation. There are no known detailed studies of mercury contaminated sites in Kenya thus no rehabilitation plans have been put in place.

5. Awareness level

CEJAD and other stakeholders have been involved in sensitization programs to raise awareness on impact of mercury use on the environment and human health. In key ASGM sites such as Osiri, Mikei and Macalder in Migori county, and Rosterman in Kakamega county, the miners are aware of mercury impacts. However, the lack of alternatives forces them to continue using mercury as it is available and easy to use.

There are several mining sites that have not benefited from sensitization programs, and where miners are practically unaware of impacts of mercury use on human health and the threat to the environment.

6. Project Outcomes (ASGM and Hg trade)

6.1. Describe the activity conducted within this project framework.

The main activities undertaken by the project included the following.

- 1. Project Introduction and notification to the relevant stakeholders and target groups:** the implementation of the project was started by identifying the relevant stakeholders to be made aware of the project and sought for collaboration to achieve the objectives of the project. In this regard, CEJAD identified the Ministry of Environment and Forestry, the Minamata focal point in Kenya as key partner for cooperation in the implementation of the project. In addition, CEJAD identified the relevant groups/representatives of the beneficiaries and target for the project, the miners and women to be involved in the project. The project identified the MICODEPRO and MICA miners' cooperatives as well as MOKA women miners groups for engagement and involvement in the project activities.
- 2. Desktop literature review:** following the project introduction and notification to relevant stakeholders and beneficiaries, CEJAD conducted literature review on the sources of mercury in ASGM both legal and illegal as well as trade in the ASGM hotpots. CEJAD began a compilation of the information based on the terms of the reference (TORs) which were provided by IPEN in the report template. Additional information was explored on the relevant policies and legal frameworks on control of mercury trade and supply including imports and exports in Kenya.
- 3. Development of tools and field data collection:** CEJAD study team developed a set of study tools which included a questionnaire for primary data collection in the field. The questionnaire development was guided by the IPEN TORs for the project. In addition, CEJAD recruited field enumerators to assist in field data collection. Two enumerators namely Bismark Onyando and George Odhiambo both from the miners' cooperatives of MICODEPRO and MICA respectively were identified by CEJAD project team to assist in the field data collection on the legal/illegal mercury supply and trade in the ASGM hotspots.
- 4. Field visits to ASGM sites in Migori:** CEJAD project team organized two study field visits to the project target area of Migori ASGM sites. The first field visit was conducted between 17th July to 23rd July 2018, by CEJAD staff Phenny Oketch and Griffins Ochieng. Accompanying the staff were journalists from Ebru TV station in Kenya. The purpose of the visit was to introduce the project to the project targets, especially the women miners, carry out advance preparation for the development of the video documentary by identifying/cases of women miners whose health/economic lives have been affected by exposure to mercury as well as follow up on the field data collection on the illegal trade and supply of mercury in the ASGM sites. Consultative meetings were held between CEJAD's Phenny Oketch and the women miners, led by chairperson of MOKA (Mikei, Osiri and Kabobo women group). The visit was also carried out as a media fact finding on the use and impacts of mercury to human health and environment. The visit by

the Ebru TV journalists was supported by CEJAD as part of the media outreach component of the project.

The second visit to the field was carried out on the 27th of August 2018 to sensitize the women miners on their involvement and engagement in the ongoing development National Action Plan (NAP) for ASGM by the Ministry of Environment and Forestry. In addition, the purpose of the visit was to carry out recording of a video documentary on short own stories of the identified women who have been affected by mercury pollution, by highlighting their work life at the mines, exposure to mercury, health and socio economic conditions and the gender aspects of mercury pollution in the ASGM hotspots.

- 5. Media Outreach and awareness** – the project carried out media outreach and awareness on the impacts of mercury to human health and environment. This was carried out through involvement of the print and electronic media in the project activities such as field visits to have the media journalists get firsthand information on the mercury use and its impacts especially to women miners. Outreach was carried out to media journalists from EBRU TV, Kenya Broadcasting Corporation (KBC) radio, reporters from both Nation Media Group (business daily) and Standard media group.

6.2 Intentional information/message to be transmitted/delivered

One of the project activities was the development of a video documentary on the short biographies of the women miners affected by mercury in the ASGM hotspots. The project therefore developed a video documentary which highlights a case story of three women miners who are working in the ASGM site of Osiri and who runs gold shops for buying of gold and are affected by mercury as a result of exposure arising from their daily activity of open burning/roasting of mercury-gold amalgam. The video documentary message highlights the gender aspects of mercury pollution as the women shares their own stories on their work lives (age, when they began working at the mines and reasons/factors for their continued stay in the work despite risks associated with the mercury exposure), their health and socio economic conditions as a result of the mercury exposure and pollution.

CEJAD intends to use the video documentary for dissemination to policy/decision makers in national and county governments from the relevant ministries and departments. This is to help highlight the mercury pollution in the country as a result of continued mercury use and exposure in the ASGM sites in Kenya to better inform the policy formulation processes both at national and county governments, for example enactment of by-laws at county assemblies and the ongoing development of ASGM NAP in Kenya.

6.4 Engagement of and impact on Target Groups

The engagement of the project targets was carried out through various activities. These included consultations, face to face bilateral meetings, town hall meetings and telephone exchanges. As a result of these actions, the following results were realized.

a) Firsthand information on mercury trade and supply in ASGM hotspots obtained

Following a series of consultations, face to face meetings and telephone exchanges, the project engaged with the MICODEPRO and MICA miners' cooperatives in Migori in the field data collection of the illegal mercury trade and supply in Migori. Two representatives of the organizations assisted CEJAD in the enumeration and data collection through administration of questionnaires which were developed by CEJAD. A total of 21 questionnaires administered/respondents obtained following the exercise resulting in primary data which was useful in the compilation of this study report.

b) Increased awareness and support to women miners for involvement in NAP development

CEJAD in collaboration with MOKA organized a one day forum with women miners from ASGM hotspots of Masara, Osiri and Mikei in Migori County. The one day meeting was held on 27th August 2018, at Mikei and was aimed at informing the women miners on the ongoing project on NAP development in Kenya and discussing ways of their involvement and engagement in the process.

To further help realize the result, CEJAD partnered with the EBRU TV in Kenya to carry out wider awareness on the impacts of mercury through mainstream media. A joint field visit was made by CEJAD team and a journalist from the media house to the ASGM hotspots of Migori on 23rd July 2018. A feature media story is currently being developed by the media station and shall be aired on EBRU TV in the month of November.

6.5. Impact on target policies

The policy targets for the project were realized through various activities which included bilateral meetings with policy/decision makers from relevant ministries and participation in various meetings/workshops related to mercury and chemicals in Kenya.

CEJAD, represented by Griffins Ochieng (programmes coordinator) participated in Kenya's national inception workshop for the project "Environment Observatories and Legal and Institutional strengthening for the Sound Management of Chemicals in Africa (Africa Chemobs) held on 16-17 July 2018 at Sawela Hotel, Naivasha. The two day workshop was organized by Ministry of Environment and Forestry in conjunction with the Africa Institute, the executing agency of the Project.

CEJAD among other stakeholders were invited to share on the activities/projects they are implemented related to the project and its objectives. CEJAD made a presentation at the meeting which highlighted the organization's work related to mercury, in particular the projects on the artisanal and small-scale gold mining (ASGM) in Kenya including the

study results on the women of child bearing age, further emphasizing the genders aspects of mercury pollution and he need for consideration of the vulnerable populations such as women in key policy decisions and national projects in the country.

In addition, CEJAD was recommended and has been listed as a member of the project steering committee, representing the non-governmental public interest organizations.



Photo 3: A view of the workshop held at Sawela Lodge, Naivasha

6.6. Outreach to Stakeholders

To help realize the project objective, CEJAD made outreach to stakeholders in government ministries and agencies as well as other stakeholders such as the media. The stakeholders were engaged at various stages of the project implementation. For instance, the Ministry of Environment and Forestry, the Minamata Focal point were reached out to and made aware of the project to lay groundwork laid for policy recommendations and influence through the outcomes and lessons learnt from the project.

Outreach was also made to the Kenya Revenue Authority (Customs department) in order to obtain latest (2017) country import data and statistics having provided CEJAD with its import data for 2014-2015. However, due to the large database and need for compilation of the relevant information requested, the customs department are still working on the information and had not been made available to CEJAD by the reporting time. Follow up is still being carried out by CEJAD team to obtain the requested data of mercury and related products listed in the Minamata Convention.

Other follow up are still being carried out by CEJAD to the stakeholders especially on the development of the ASGM NAP and implementation of the Chemobs project.

6.7. Deliverables, outputs and/or products

The following deliverables of the project were realized:

1. A video documentary on women miners affected by mercury showing own stories on the impacts of mercury and effects to their health
2. Media feature on Ebru TV for awareness on impacts of mercury
3. Report on the trade, supply networks of mercury in ASGM hotspots in Kenya
4. Summary notes of the meetings with target groups

6.8 Communication Efforts

CEJAD conducted outreach to the media with an aim to work closely with the media institutions to raise awareness on the negative impacts of mercury among the miners in Kenya and Kenyan public in general. In addition, the collaboration is aimed at sensitizing the media on the Minamata Convention on Mercury.

In this regard, CEJAD made outreach to EBRU TV, Nation Media Group, KBC radio and the Standard media for continued media coverage and reporting on mercury related issues especially the negative impacts to miner's health and the environment. The project intends to disseminate the video documentary on the stories of women affected by mercury in Migori to the media as well as other stakeholders, especially to policy/decision makers in relevant policy forums such as workshops, conferences and seminars.

Further the results of the project, deliverables such as the video documentary/reports and media coverage of the organizations work have been posted on the CEJAD's website at www.cejadkenya.org.

6.9 Communication with National or Local Authorities

Yes, at the beginning of the project, CEJAD organized a meeting with the Minamata Focal Point in Kenya to inform the Ministry of Environment on the project and its intended results

7. Conclusions and Recommendations

It is evident that mercury use in ASGM is rampant in the country. As more people go into gold mining lured by the new discoveries of Gold, the problem of mercury may be scaled up in the absence of alternatives. Despite being a controlled substance, mercury is readily available in the ASGM areas showing weakness in enforcement especially in controlling the illegal mercury supply and trade in the sector.

Awareness levels on dangers of mercury on the environment and human health still remains low as most ASGM counties have not benefitted from awareness programs. ASGM activities are still spreading in more areas within the gold belt thus there is need for concerted efforts in mercury control and management in the ASGM sector.

7.1. Recommendations

- **Strengthen regulations and compliance monitoring to control illegal mercury supply and trade in ASGM** –government agencies especially those responsible for border control and entry of illegal products need to proactively enforce regulations and continuously monitor illegal mercury entry into Kenya and the supply chains to the ASGM sector
- **Education and Awareness:** Need for concerted efforts to reach the under reached areas where gold mining is picking up, so as to educate the miners on safe mining practices, as well as the impacts of mercury use. Awareness programs should also sensitize the miners on the Minnamata convention and the need to shift towards practical alternatives.
- Some government agencies in charge of some aspects of enforcement especially control of entry and trade in illegal products in the country, have low awareness levels on mercury, thus a need for a specific sensitization plan targeting government agencies, in preparation for compliance with the Minamata convention.
- **Technology:** the only reason mercury is widely used is because it is the technology that miners know about and are able to access. This calls on stakeholders in the mining sector to research and avail practical alternatives that can be utilized in Gold extraction efficiently and safely
- **Enforcement:** the mining areas are vast thus a challenge to government agencies which are largely understaffed. There is need to set up a self-enforcement framework within each mining site where the local miners can be

shown safe mining practices and encouraged to do self-monitoring and enforcement so as to ensure their mines remain sustainable.

- **Formalization:** Most ASGM activities are still informal thus a challenge in piloting interventions such as access to credit facilities and technology. There is need to put more effort in sensitizing the miners on benefits of formalization, as well as facilitating the process of formalization.

8. Annexes

Annex 1. Project Pictures



Photo 4: bottle for storing mercury, Photo Credit: CEJAD



Photo 5: CEJAD's Griffins pose for picture with MOKA officials, photo credit: CEJAD



Photo 6: CEJAD team at a sensitization for women miners, photo credit: CEJAD



Photo 7: CEJAD team with members of MOKA group, photo credit: CEJAD

Annex 2: Summary notes/minutes of field meetings

SENSITIZATION MEETING OF WOMEN MINERS AND GROUPS IN OSIRI, MIKEI AND MASARA, MIGORI COUNTY ON THEIR PARTICIPATION IN THE DEVELOPMENT OF NAP IN KENYA AT MICA COOPERATIVE HALL, MIKEI. ON 27TH AUGUST 2018, 3PM-5.30PM

Agenda

1. Introduction
2. About MOKA women group
3. National Action Plan (NAP)
4. A.O.B

Min 1/08/018 Introduction

The meeting started by a word of prayer from the chairlady, MOKA group, Eunice Atieno followed by introduction by members present Ms Eunice later welcomed all the members present.

Min 2/08/018: About MOKA women group

Ms Eunice gave a brief history of the MOKA women group started in 2016 after the hair sampling exercise of women of child bearing age in the Migori ASGM areas, conducted by an organization CEJAD. After the results came back and the mercury levels in the women's blood were found to be high, they saw it wise with the help of their leaders to be united and also recruit other women miners involved in amalgamation and burning of the amalgam so that they can talk about the issues facing them as women and precautionary measures. The name MOKA came up as a result of the women coming from Mikei, Osiri and Kabogo hence MOKA. They currently have 18 active members.

MOKA women group activities

Table banking- The women meet on a weekly basis, every Wednesday, collect cash and give to a member every time they meet. Savings and loan-They collect money as savings and give members as loan with 10% interest. At the end they share the interest depending on one's savings. They give loans up to Ksh.5000.

MOKA's plan

a) Group registration.

The chair visited the social services offices and got all the requirements for registration of the group to get a certificate. Among the requirements are:

- Constitution-this contains the rules and regulations of the group.

- Membership card- this is given to every member to show their identity.
- Minutes of the group- this to be typed and kept well in the file for future reference.

Min 3/08/018: National Action Plan

It deals with addressing issues of mercury in Kenya. It aims at involving women in the NAP development process since they are the most vulnerable to mercury pollution in the ASGM. Women were encouraged to strengthen their group so they may be involved in meetings for their voice to be heard during the process, share their stories on exposure to mercury and impacts that will enhance their advocacy towards seeking solutions to the health and environmental impacts.

Min 4/08/018: A.O.B

A member asked Mr. Griffins about a promise he made to them concerning support towards registration of the group. Mr. Griffins agreed to the request and asked the chair lady to send him a text message concerning all the requirements.

Min 5/08/018: Closing remarks

Mr. Griffins encouraged members to keep the same spirit of unity and hard work; he also urged them to always consult their local leaders such as George and Julius especially during the making of the constitution. Vote of thanks was given by Eunice the chairlady and then the meeting was adjourned.

**Sensitization meeting of women miners and groups in Osiri, Mikei and Masara, Migori
County on their participation in the development of ASGM NAP in Kenya**

27th August 2018 at MICA cooperative hall, Mikei,

REGISTRATION FORM

NO.	NAME	ORGANIZATION	WHERE FROM	TELEPHONE
1.	Hellen Achiong	MOKA women group	Osiri	
2.	EVERLINE ALUOCH	MOKA WOMEN GROUP	OSIRI	0713901579
3.	Nancy Atieno	MOKA WOMEN GROUP	Kabobo	0706011998
4.	Monica Digo	moka "	Mikei	0729037562
5.	MONICA ACHENG	MOKA "	MIKEI	0713084157
6.	MART ORUHO	MOKA "	MIKEI	
7.	SOPHIA AKIMO	mbka "	MIKEI	0704304148
8.	SUZAN AKENO	MOKA "	MIKEI	0791244046
9.	JANEI AICENO	MOKA "	MIKEI	0791244046

**Sensitization meeting of women miners and groups in Osiri, Mikei and Masara, Migori
County on their participation in the development of ASGM NAP in Kenya**

27th August 2018 at MICA cooperative hall, Mikei,

REGISTRATION FORM

NO.	NAME	ORGANIZATION	WHERE FROM	TELEPHONE
1.	Hizabisa Odiambo	Nicosop	Masara	072713040
2.	Sybilu Alula	MOIKA	MIKEI	
3.	Eunice Alieno	MOKA	OSIRA	0703874178
4.				
5.				
6.				
7.				
8.				
9.				