



Artisanal and Small-Scale Gold Mining in Nigeria

Recommendations to Address Mercury and Lead Exposure

Executive Summary



Acknowledgements

This report was prepared by the Environmental Law Institute (ELI) with funding from the U.S. Department of State. The contents of this report do not necessarily represent the views of the State Department, and no official endorsement of the report or its findings by the State Department may be inferred.

Principal ELI staff contributing to the project were Lisa Goldman, John Pendergrass, David Roche, Narayan Subramanian, and Judy Amsalem. Any errors and omissions are solely the responsibility of ELI. The authors welcome additions, corrections, and clarifications for purposes of future updates to this report.

About ELI Publications—

ELI publishes Research Reports that present the analysis and conclusions of the policy studies ELI undertakes to improve environmental law and policy. In addition, ELI publishes several periodicals—including the *Environmental Law Reporter*®, *The Environmental Forum*®, and the *National Wetlands Newsletter*—and books, which contribute to education of the profession and disseminate diverse points of view and opinions to stimulate a robust and creative exchange of ideas. Those publications, which express opinions of the authors and not necessarily those of the Institute, its Board of Directors, or funding organizations, exemplify ELI’s commitment to dialogue with all sectors. ELI welcomes suggestions for article and book topics and encourages the submission of draft manuscripts and book proposals.

Artisanal and Small-Scale Gold Mining in Nigeria: Recommendations to Address Mercury and Lead Exposure – Executive Summary

Copyright © 2014 Environmental Law Institute®, Washington, D.C. All rights reserved.
ELI Project No. 121001

An electronic retrievable copy (PDF file) of this report may be obtained for no cost from the Environmental Law Institute website, www.eli.org. Click on “ELI Publications,” and search for this report. [Note: ELI Terms of Use will apply and are available on the website.]

(Environmental Law Institute®, The Environmental Forum®, and ELR® – The Environmental Law Reporter® are registered trademarks of the Environmental Law Institute.)

Cover Photos:

Top: Gold miners in Bagega, Zamfara State. © 2013 Lisa Goldman/ELI

Bottom: Gold miners in Dareta, Zamfara State. © 2012 Lisa Goldman/ELI

Artisanal and Small-Scale Gold Mining in Nigeria: Recommendations to Address Mercury and Lead Exposure

Executive Summary

In 2010, a major lead poisoning outbreak in Zamfara State, Nigeria made international headlines. Traced to artisanal and small-scale gold mining (ASGM) operations, the scope of the toxic exposure was devastating—more than 400 children under the age of five died over a six-month period. This tragic incident underscored the chronic exposure to lead (as well as mercury) that was taking place every day throughout much of northern Nigeria. The lead poisoning outbreak sparked an international remediation and treatment effort in Zamfara that is still continuing, along with a newly-launched Safer Mining Programme on the part of the federal government that seeks to instill safer mining practices and introduce improved technologies in mining communities.

This assessment looks forward, past the immediate response to the Zamfara tragedy, to the legal and policy challenges underpinning the informal ASGM sector in Nigeria. The assessment presents legal, institutional, and financial recommendations designed to improve long-term health and environmental outcomes from the ASGM process. These recommendations are intended to accelerate the formalization of artisanal miners in order to encourage the development and dissemination of best mining practices. The ten specific recommended measures are anchored in a general framework designed to incentivize formalization, decentralize the cooperative and licensing process, facilitate miner communication and education, and encourage coordination among stakeholders.

Notably, reformed mining practices that lead to healthier communities and a safer environment are also more economically efficient. By aligning the incentives for all players, the assessment's recommendations seek to promote three interrelated objectives: save health and lives, strengthen environmental protection, and generate income for national and community development.

Methodology

This assessment of Nigeria's ASGM sector was written to address needs and opportunities within the sector, focusing on practical legal and policy recommendations. The research process consisted of three methods to gather information about the sector:

- Comprehensive desk research on ASGM policies and practices;
- In-person and phone interviews with ASGM experts, both in Nigeria and globally; and
- In-person interviews in Abuja and Zamfara, Nigeria in September 2012 and June 2013, including meetings with government officials, nongovernmental organizations, and mining groups, with additional visits to mining processing sites.

The recommendations in this assessment will be reviewed by key stakeholders, including mining communities, regulators, civil society/NGO groups, and experts, both within Nigeria and globally. Some of this review will take place at a consultative workshop currently being planned.

While the scope of the current project does not encompass on-the-ground implementation of the recommendations, discussion and planning for an implementation approach has taken place as part of the outreach conducted around the release of this paper.

ASGM in Nigeria

Unlike countries such as Ghana and Burkina Faso, Nigeria currently has no well-developed, formalized industrial gold mining sector. While gold prices vary and are subject to boom-and-bust cycles, the recent high prices have attracted a new wave of informal ASGM miners. The number of miners is further bolstered by a ready supply of mercury to process raw ore and a lack of viable alternative livelihoods. This has led to a resurgence of ASGM activities in northern Nigeria, accompanied by dire health, environmental, social, and economic consequences.

The hazards posed by ASGM activities derive from the process used to extract the gold ore from source rock. Apart from the risks posed by small groups of workers descending into mines prone to collapse, the high levels of lead present in the rock and the use of mercury to extract gold impose significant public health and environmental risks. Lead dust is released when mined ore is mechanically ground and processed, and soil lead concentrations in Nigeria have exceeded 100,000 ppm, 250 times greater than the U.S. EPA's recommended levels. Mercury is burned off after being used to amalgamate the gold, emitting volatile, airborne compounds. Mercury also contaminates the water supply, where it is naturally converted into highly toxic methylmercury.

Safer mining technologies can reduce lead and mercury emissions by more than 90%. An array of technologies exists that can reduce or eliminate mercury use, including gravity-based methods to concentrate the ore, retorts and fume hoods to capture and reuse mercury, and mercury-free processing technologies such as iGoli. Several of these methods allow for economically efficient reuse, in addition to protecting health and environmental quality. Lead exposure can be reduced through simple methods such as wet milling. When combined with other best practices (processing in open, well-ventilated areas and rinsing hands and clothing of all excess lead dust), these available technologies can limit or eliminate mercury and lead exposure. The recommendations in this assessment focus on creating the enabling conditions for the formalization of artisanal miners and the adoption of such technologies by mining communities, so as to minimize the health, environmental, social, and economic problems discussed above.

Recommendations for Addressing Lead and Mercury Contamination from ASGM Activities: A Formalization Approach

Formalization can be broadly defined as the integration of artisanal mining activities into Nigeria's legal, economic, and institutional framework. By bringing artisanal miners under a legal framework that includes secure tenure, a valid license, and access to credit, miners will have greater support, incentives, and resources to improve their operations, develop safer mining practices, obtain greater profits, and potentially scale up their operations to the level of small- and medium-scale mining. The formalization process, in turn, is aimed at encouraging the development and dissemination of best practices, including the reduced use of mercury in the gold refining process and the introduction of measures to mitigate exposure to mercury and lead

poisoning. While legal frameworks are a key tool for transforming ASGM from an informal to a formal activity, they must also be used in a way that enables rather than restricts miners.

The Nigerian government is taking positive steps toward formalization—for example, the Ministry of Mines and Steel Development’s Safer Mining Programme has been helping to register more artisanal mining cooperatives, train miners on safer mining practices, and introduce improved mining processing technologies. However, the current practice of informal mining often falls outside the scope of the government efforts. To catalyze the transition to formalization, the draft assessment examines legal frameworks, institutional aspects, and financial considerations that could aid Nigeria’s economy, public health, and environment. In particular, the draft assessment examines the feasibility of developing federal, state, and local or customary regulations and guidelines (including under Sharia law) concerning ASGM practices. Generally, recommended measures entail:

- **Incentives** for all parties to facilitate the formalization of ASG miners
- **Decentralization** of cooperative and licensing processes
- **Communication** with miners about requirements and status
- **Coordination** with other actors working on mining issues

The recommendations presented below were derived from interviews with experts in Nigeria and globally, as well as comprehensive desk research and input by select mining communities. Generally, both lead exposure and mercury use should be considered when devising and implementing strategies related to ASGM, along with implications for other types of solid mineral mining practiced in Nigeria. The specific recommendations highlighted below are explained more thoroughly in the accompanying report.

Legal Recommendations

Priority 1: Address the Cooperative Barrier

Short-term

- a) Determine who should be registering artisanal miners in each state, either alone or working together with other entities (e.g., the state ministry responsible for cooperatives, zonal and federal mines officers with the Ministry of Mines and Steel Development (MMSD), the state environmental ministry, and any other groups).
- b) Consider having MMSD’s zonal and federal mines officers work with state officials to sensitize miners about the benefits of formalization.
- c) Develop a training program for newly-formed cooperatives to help ensure they are operating effectively and safely.
- d) Consider having MMSD’s zonal and federal mines officers meet regularly with the state environmental ministry and state ministry responsible for registering cooperatives, to provide updates on any new cooperatives that have formed.
- e) Consider having MMSD’s zonal and federal mines officers reach out to the Nigerian Miners’ Association and traditional rulers for help encouraging miners to form cooperatives.

- f) MMSD might consider designating a specific time period for a cooperative registration drive (e.g., one or two months) and devote a significant amount of resources to helping miners register. The relevant desk at the Mining Cadastre Office (MCO) could coordinate with the state ministry that registers cooperatives in each state, as well as with other groups including the Nigerian Miners' Association, traditional rulers, and civil society groups.

Long-term

- g) Consider dropping the requirement (in Section 91 of the 2007 Minerals and Mining Act) that miners form cooperatives in order to obtain extension services from MMSD; or
- h) Amend the legal requirements to make it easier to form cooperatives and/or register them at MMSD.
- i) Create MCO zonal offices to coordinate with state ministries of environment and health to help miners form cooperatives (or other recognized organizational entities).
- j) State offices that register cooperatives could create outposts in larger villages or towns to help miners register.
- k) Given the large number of migratory laborers working as artisanal miners, MMSD and state authorities could clarify that foreign national artisanal and small-scale miners can join cooperatives or other recognized legal entities, so that these miners will not be marginalized and possibly undermine the progress of other miners.

Priority 2: Strengthen Access to Land

Short-term

- a) Take testimony from villagers as evidence regarding the issue of false consent, in order to determine the scope of the problem and how to address it.
- b) Designate an entity to hear and help resolve disputes between mineral title holders, local landowners, and artisanal miners related to land access.
- c) Adopt the proposal by the President of the Miners Association for the Mining Cadastre Office and the Miners Association to organize an educational campaign for traditional rulers about the landowner consent provision (Section 100) of the Minerals and Mining Act. This would include the requirement that it is the landowner, not the Emir, who must give consent. As part of the training events, copies of the Mining Act and Regulations and contact information for relevant officials at MMSD and the MCO could be given to the traditional authorities.

Long-term

- d) Develop a mechanism by which title holders can grant permanent, temporary, or conditional access to marginal deposits by artisanal miners, and prepare a template or model agreement to help facilitate this process.
- e) Develop a regulation requiring regular inspections of mining sites at designated intervals in order to enforce the "use it or lose it" principle expressed in Sections 70(1)(a) and 151(g) of the Minerals and Mining Act.
- f) Amend Section 100 of the Minerals and Mining Act (regarding notice and consent to private landowners or a proposed mineral title) to require community consultation before mineral rights are allocated.

- g) Consider requiring large-scale mining companies to return a certain percentage of their concessions to the federal and state governments after a designated time period, to encourage timely exploration and to make more lands available to artisanal and small-scale miners.

Priority 3: Improve the ASGM Licensing Process

Short-term

- a) Establish MCO zonal offices to work more closely with mining cooperatives and individual applicants to obtain licenses (although Section 6 of the Mining Act requires “an appropriate number of Zonal offices” to be maintained by the MCO, it is unclear whether this has yet happened).
- b) Continue developing a system for miners to apply for licenses online, along with an electronic database of mineral titles.
- c) Include maps showing the availability of deposits suitable for artisanal mining activities in MCO’s online mining cadaster tool, and have MMSD zonal and federal mining officers work to educate miners about the information available in these maps (including in areas without access to online information).
- d) Explore opportunities under the current Mining Act and Regulations to make it easier for artisanal miners to meet the requirements for a Small-Scale Mining Lease, including through possible revisions to the fee structure and technical requirements.

Long-term

- e) Establish a new Artisanal Mining Lease category under Part IV of the Minerals and Mining Act and Part II of the Minerals and Mining Regulations. Ideally, consultation would be held with artisanal miners, civil society groups, state and federal ministries, and other stakeholders as part of the process to design the new mining lease.
- f) Decentralize the license application process by establishing a system for mining license applicants to apply through MCO zonal offices and/or MMSD field offices. As part of this system, MMSD’s zonal and field offices could set up computers for miners to use (with technical assistance) to submit applications electronically to a central database.
- g) State environmental ministries, traditional authorities, the miners’ association, and civil society groups could work (individually and together) to help educate and enable miners to take advantage of such a system.

Priority 4: Ensure Environmental Protection

- a) MMSD and the Federal Ministry of Environment (FMENV) can work together and in collaboration with relevant state ministries to simplify the environmental protection requirements for artisanal miners seeking a small-scale or artisanal mining license. Options include the development of a general environmental permit, a collective EIA (environmental impact assessment) process, or an environmental information sheet (or similar approach) in place of the formal Environmental Impact Assessment and Environmental Protection and Rehabilitation Program currently required under Section 119 of the Mining Act.

- b) Use MMSD extension services and state environmental and health ministries to help miners meet environmental requirements for obtaining a mining license.
- c) Educate miners about the environmental impacts of mining activities and importance of environmental protection measures, as well as resources available to help them comply with environmental requirements. Demonstration sites of best practices for environmental protection could also be created to help educate miners.
- d) Strengthen coordination between FMENV, MMSD, and state environment and health ministries regarding environmental protection from ASGM activities, including by defining more clearly the respective roles of FMENV and MMSD's Mines Environmental Compliance Department at both the federal and state level.

Institutional Recommendations

Priority 5: Collect Royalties from Artisanal Mining Activities

- a) Consider restructuring the current three percent royalty rate for gold revenues from artisanal mining activities (e.g., based on size of mining operation or market price of gold).
- b) Consult with traditional rulers about an equitable revenue-sharing approach for gold mining revenues.
- c) Consider adopting a provision that directs a designated percentage of royalties paid by artisanal and small-scale gold miners to a Community Mining Improvement Fund. The fund could be modeled to a certain extent on the Solid Minerals Development Fund, but would be tailored to the needs and conditions in mining communities.

Priority 6: Strengthen Extension Services and the Dissemination of Improved Mining Technologies

- a) Train MMSD's Artisanal and Small-Scale Mining (ASM) Department regarding the range of alternative mining technologies that can reduce as well as eliminate mercury use, including the use of retorts and gravity-based separation methods.
- b) Incorporate technical assistance to miners into the ASGM licensing process.
- c) Train representatives from the Nigerian Miners' Association, mining communities and cooperatives, and civil society organizations on improved mining technologies so they can replicate the training for artisanal miners. Training courses run by MMSD, FMENV, and state ministries of environment and health can also address the process of obtaining a mining license, how to comply with environmental requirements, and the health impacts of mercury use and lead exposure.
- d) Organize pilot demonstration projects for mining communities to showcase the range of alternative mining technologies.
- e) Consider establishing gold processing centers for miners that would employ improved mining technologies, such as the iGoli machines currently being introduced as part of MMSD's Safer Mining Programme.

- f) Strengthen the Solid Minerals Development Fund under Section 34 of the Mining Act, which is intended in part to help enable the provision of extension services to artisanal miners.

Priority 7: Strengthen Community Education and Outreach

- a) The Federal Ministry of Health could develop and update public health strategies on mercury and lead as part of Nigeria's National Action Plan, and coordinate these strategies with health education efforts at the state, local, and community level.
- b) The Ministry of Health, ideally in coordination with MMSD, FMENV, state ministries, and relevant NGOs, could work with traditional authorities in local government areas, towns, and villages to organize educational meetings for men and women (including teens and adolescents) about health and safety concerns linked to ASGM activities, including lead and mercury contamination.
- c) Federal and state ministries can engage community groups such as gold buyers and sellers' associations, community-based organizations, and other stakeholders in community education workshops and outreach.
- d) MMSD can require a mining safety educational course as part of the process for obtaining an artisanal or small-scale mining license.
- e) The Ministry of Health, in coordination with MMSD, FMENV, state ministries, and relevant NGOs, can develop educational materials (including those using illustrations to convey their messages to illiterate populations) to be disseminated at markets and other community meeting points.
- f) Encourage medium- and any existing large-scale mining companies to support education and awareness programs in ASM communities.
- g) Seek funds from government educational ministries, international organizations, and agency discretionary spending to support outreach activities by the state Rapid Response Teams from the State Ministry of Health and State Ministry of Environment and Solid Minerals around safer mining practices.

Priority 8: Improve Coordination among Institutions and Stakeholders

- a) Use the requirement to draft a National Action Plan under the Minamata Convention on Mercury as an opportunity to bring stakeholders together around formalization of artisanal miners and the need to address lead/mercury contamination.
- b) Form a working group or advisory council composed of all relevant stakeholders to focus on formalization and mercury/lead contamination issues.
- c) MMSD zonal and federal mines officers can meet with state environmental and health ministries to discuss their respective activities around mercury use and safer mining practices.
- d) Publish a directory in print and online with names of all parties working on artisanal mining and mercury/lead issues, including their names, affiliations, roles, and contact information. The directory could be disseminated within state and government ministries, civil society organizations, miners' associations, and other relevant groups. It could be compiled and maintained by a national commission or working group (as recommended

in Part 6 on Approaches for Implementation); alternatively, the federal government could fund a nongovernmental organization working on ASGM issues to produce the directory and keep it up-to-date.

Financial Recommendations

Priority 9: Improve Access to Markets

Short-term

- a) Improve the registration process for licensed buying centers, such as by providing notice to applicants when their application is deemed incomplete, along with an explanation of the problems with their application. MMSD could also assist applicants with the application process for mineral buying centers.
- b) Assist mineral buying centers in obtaining export permits to sell gold internationally.
- c) Support the establishment of additional licensed mineral buying centers near mineral processing sites to provide greater options to miners for selling their gold.
- d) Consider whether the government should provide price support to mineral buying centers to make them more competitive with unlicensed dealers.

Long-term

- e) Consider whether the government should play a role in the marketing chain by acting as an official buyer, in order to enable miners to receive a fair market price for their gold and to monitor the gold trade more closely.
- f) In conjunction with long-term recommendation (c) under Priority 1, work to establish a government purchasing scheme to buy gold at an above-market price from licensed gold mining cooperatives.
- g) Consider allowing individuals to register for a license to purchase artisanally-mined gold.
- h) Consider whether to pursue fair trade certification for artisanally-mined gold.
- i) Strengthen miners' access to credit (see recommendations in next section) so that they are not obligated to accept predatory loans from middlemen for supplies and equipment.

Priority 10: Strengthen Access to Credit

Short-term

- a) States and community-based organizations could work with miners to develop improved financial management practices to reduce their reliance on predatory buyers.
- b) Research the successes and failures of different financing mechanisms developed and used throughout Africa, including the approaches highlighted above, to determine which strategies might work best in Nigeria.

Long-term

- c) Create property rights in mineral licenses through a new ASGM license, as proposed in Priority 3.
- d) Work with banks to establish a line of credit for artisanal miners.

- e) Work with miners to develop revolving community savings banks that generate interest and can be used to make loans.

Approaches for Implementation

At the implementation stage, it will be critically important to strengthen the capacity of the Nigerian government. The Ministry of Mines and Steel Development, Federal Ministry of Environment, and other agencies at the federal and state level must play a primary role in developing any new legal or regulatory authorities, as well as in making any institutional and policy changes. Local authorities in the form of traditional rulers (Emirs) can also be particularly influential, especially since much of northern Nigeria functions under customary Sharia law. Implementation of a strengthened legal and policy framework will also require educating artisanal miners about their legal obligations and, ideally, providing technical assistance to help them meet these obligations.

Any implementation plan must include participation from the full range of stakeholders involved in, or affected by, ASGM activities. This includes miners, their families and communities, and mining associations as well as relevant government agencies and ministries at the state and federal level (including the ministries of mining, environment, and health), customary authorities, civil society organizations, and pertinent international actors. Involving all of these stakeholders will require improved coordination and communication, particularly between the different federal ministries as well as state and federal authorities. Ideally, the development of an implementation plan, which could take the form of, or be closely incorporated into, a National Plan of Action under Minamata, would lay the groundwork for continued coordination and cooperation among all of these different actors.

Possible implementation strategies include:

Prepare a National Action Plan under the Minamata Convention

The National Action Plan that is required under the Minamata Convention provides a natural platform for developing an implementation strategy for addressing mercury (and lead) contamination from ASGM activities. The Plan's requirements, set forth in Annex C, include steps to facilitate the formalization or regulation of the ASGM sector, strategies to promote the reduction of mercury in ASGM activities, and a public health strategy on mercury exposure for miners and their communities.

Form a National Commission, Working Group, and/or Stakeholder Advisory Group

Whether Nigeria chooses to develop an ASGM approach through the preparation of a National Action Plan or some other means, it is important to establish some sort of coordinating mechanism to move implementation forward. In designing a coordinating mechanism, Nigeria could build on existing approaches to address lead poisoning and mine safety issues in Zamfara State, such as the working group composed of state environmental officials, miners' groups, community-based organizations, and other stakeholders that has been meeting in Zamfara on a monthly basis; the Safer Mining Programme launched this year by MMSD; or any other inter-agency working groups that may already exist. Given the overlapping mandates and assertions of

jurisdiction between some of the ministries, it would be helpful to have a representative from the Office of the President take charge of the working group.

Build the capacity of government ministries & agencies

The successful development and implementation of a strengthened formalization approach for ASGM will hinge on the ability of Nigeria's federal government to mobilize resources and work with states and other partners on a wide spectrum of activities. The potential for long-term impacts from ASGM reforms can be undermined by poor institutional effectiveness and capacity, in addition to funding constraints. Stakeholder ministries can advocate for funding to strengthen their capacity and improve the allocation of resources towards activities such as extension services. This is a prime area where assistance from international organizations would be useful. More intensive training that brings different ministries and agencies together would also strengthen inter-agency communication and cooperation around ASGM activities. One way to address some of the jurisdictional struggles would be for international partners to fund an inter-ministerial working group composed of representatives from different ministries, rather than allocate funding to individual agencies.

Educate miners, their families, and communities about new legal and regulatory requirements

Just as it is important to undertake education and outreach about the health impacts of lead and mercury, so will it be important to educate miners and others about new legal and regulatory requirements. In particular, MMSD and other ministries can work to address misconceptions about such things as the length of time it takes to receive a mining license. It would also be helpful to prepare educational materials (such as illustrated pamphlets) to disseminate to miners, their families, and their communities. Workshops can be organized to inform miners about new legal, institutional, and financial developments, drawing on the same approach recommended under Priority 7.

Engage the private sector

Although Nigeria does not yet have the well-developed large-scale gold mining sector found in other countries (such as Tanzania and Ghana), medium-scale operators composed of foreign nationals also have an interest and can play a constructive role in formalization efforts. A more formal, operational ASGM sector can benefit these operators through fewer conflicts over land, the availability of better-trained miners as a potential labor pool, a partnership that can yield the opportunity to reprocess tailings from ASGM operations (as is already being done in some areas) as well as other forms of cooperation, and a more secure and safe mining environment overall. Attention should also be paid to the incentives that private companies may or may not have to help miners adopt improved mining techniques to reduce their use of mercury.

Identify a role for enforcement

As Nigeria transitions towards a more formal ASGM sector, identifying a role for enforcement in a strengthened legal and regulatory framework will be essential. One potential area is the vexing problem of child labor. The Nigerian Miners' Association has been considering making a recommendation to restrict children under ten years of age from working in ASGM, and Zamfara State has considered drafting a law that would ban child labor in mining as well. An enforcement approach may also become relevant in the future with respect to the role of mercury in ASGM activities. While restricting or prohibiting mercury use in ASGM is not recommended at this

time, given the absence of practical alternatives and the dubious effectiveness of a hard-line approach, a law to regulate the distribution, use, storage, and/or trading of mercury might become desirable once the enabling conditions to facilitate a transition to mercury-free alternatives have been established. Nigeria might also wish to start tracking mercury supply and use, including where it is coming from, who is importing it, and how it is making its way to the mining sites. Gaining an understanding of the current trade pathways for mercury will help Nigeria consider how to restrict its importation and use in the future. This will also help Nigeria comply with its obligations under Minamata, which restricts gold exports to countries that have provided prior informed consent.