



**ANGLOPHONE WEST AFRICA REGIONAL AWARENESS-
RAISING WORKSHOP ON MERCURY IN ARTISANAL
SMALL SCALE GOLD MINING (ASGM)**

Organised by

THE FEDERAL MINISTRY OF ENVIRONMENT, NIGERIA

In collaboration with

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA)

And

UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)

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Final Report

Background and Overview

1. At its twenty-fifth session, and by section III of its decision 25/5 of 20 February 2009, the Governing Council of the United Nations Environment Programme (UNEP) agreed to the elaboration of a legally binding instrument on mercury and asked the Executive Director of UNEP to convene an intergovernmental negotiating committee with the mandate to prepare that instrument, commencing its work in 2010. In the same decision, the Governing Council also requested UNEP to continue and enhance, as part of the international action on mercury, the existing work, in a number of areas, including awareness-raising and pilot projects in key countries to reduce mercury use in artisanal and small-scale gold mining.
2. To inform overall global actions, UNEP and its partners in the Global Mercury Partnership convened a regional Anglophone West African Workshop on artisanal and small-scale gold mining from 8 to 10 June, 2011 in Lagos.
3. The Workshop was attended by sixty seven (67) participants from the Governments of Liberia, The Gambia, Nigeria and Mali, including International Experts from Mozambique, Ethiopia, Senegal, Canada, Tanzania and United States of America. Other experts from Nigeria include those from the Academia, Miners Association of Nigeria. Government Agencies and parastatals such as the National Environmental Standards and Regulations Enforcement Agency (NESREA), the National Emergency Management Agency (NEMA), Nigerian Institute Of Mining and Geosciences, Nigerian Geological Survey Agency and Sustainable Management Of Mineral Resources Project. Non-Governmental Organizations (NGOs), SRADev Nigeria and AGENDA, affiliates of IPEN / Zero Mercury Working Group, including Nigerian Mining and Geosciences Society, the BCCC-Nigeria, the Media and UN Agencies. The language of the workshop was English.
4. The Workshop provided an opportunity for stakeholders to consider how to tackle mercury-related issues in artisanal and small-scale gold mining and to initiate a dialogue on the broader range of issues associated with such mining. The specific objectives of the workshop included: to review the challenges and opportunities surrounding the topic; to discuss policies and other instruments that could play a role in tackling artisanal and small-scale gold mining issues; to discuss success stories; and to strengthen the Global Mercury Partnership area on artisanal and small-scale gold mining.
5. It was reiterated that participants had an important role to play in reporting on the issue and the global forum to their respective Governments and delegates to the Intergovernmental Negotiating Committee to prepare a national action plan and global legally binding instrument on mercury. It was also suggested that participants might wish to work together within their regions in an effort to speak with one voice during the negotiations.

Key messages from the Regional Workshop

6. The following key messages emerged from the Workshop:
 - (a) Artisanal and small-scale gold mining is a complex global development issue that presents challenges and opportunities in many countries;

(b) Mercury is a key entry point into the issue of artisanal and small-scale gold mining, but such mining is linked to a number of broader social and environmental issues that have external costs to society. Baseline information supports ability to take action;

(c) The artisanal and small-scale gold mining community can take steps to reduce the demand for mercury in the short and long terms. Participants agreed upon a set of technical options for reducing mercury use and releases, including some promising non-mercury technologies;

(d) Formalization is important, and specific requirements for it will vary from situation to situation. Formalization requires stakeholder engagement, financial and technical support, access to markets, capacity-building and training;

(e) There is an important and complex relationship between artisanal and small-scale gold mining and large-scale mining;

(f) Lack of access to formal credit markets as a result of the informal nature of the sector is a barrier to miners' implementing change. Model financing schemes (funded through the World Bank, the Global Environment Facility, the Strategic Approach to International Chemicals Management and bilateral means) exist that support the sector and can play a role in a transition to low-mercury and non-mercury techniques. Developing such programmes further in the future is important.

7. Additionally the workshop proposed the following recommendations

(a) The need for the development of appropriate and adequate policies and regulatory reforms, accurate data base on mercury use, risk management plan, adoption of environmentally friendly technologies and sustained awareness raising in all the countries in the West African region as strategies for reduction in the use of mercury in ASGM.

(b) The need for development of national strategic and action plans by countries in the west African subregion including a regional action plan for the phase out of mercury in artisanal and small-scale gold mining sector.

(c) The need for EIAs in a simplified form for upcoming or new mining projects and sector specific environmental management plans for existing artisanal miners, including a sector specific environmental management plan, to be undertaken for small scale mining projects including geological surveys of mining sites.

(d) The need for sensitization and awareness raising campaigns focused towards the prohibition of mining, milling and processing in residential communities while enabling miners to continue their work safely.

(e) Establishment of National Interministerial Committees on ASGM to oversee issues, including *inter alia* the following:

- Development of national strategic plans on ASGM,
- Development and implementation of safe mining practices,
- Environmental Remediation of contaminated mining sites in each village and
- Medical Treatment for exposed and impacted communities

(f) The need to strengthen enforcement mechanisms of regulatory and monitoring frameworks of each of the countries in the sub-region.

(g) The Government of Nigeria should immediately intervene to save the lives of Nigerian children who are facing death threat from lead poisoning in Zamfara State. There is also an urgent need by the Federal Government to reinforce remediation and prevention activities in Zamfara State of Nigeria.

Table of Contents

I.	Opening of Workshop	6
II.	Session 1: Introductory Remark by UNEP	7
III.	Session 2: Presentation of National Situations	8
IV.	Session 3: Technical Aspects	12
V.	The Zamfara Incidence	16
VI.	Session 4: Legalization and formalization of ASGM in Anglophone West Africa	18
VII.	Session 5: Financing Dialogue	21
VIII.	Session 6: Regional Priority Settings and Next Step	23
Appendices		
I:	Environmental / Technical Intervention	24
II:	Formalization of ASGM	26
III:	Brief Context / Overview of ASGM Issues	27
IV:	Workshop Communique	

DAY ONE

I. Opening of the workshop

8. The workshop was declared open on Wednesday, 8th June 2011 at 10.10am.

9. The Permanent Secretary, Ministry of Environment of Nigeria, Mohammed Sambo Bashar represented by Olori Funke Babade, Director, Department of Pollution Control & Environmental Health welcomed the participants and highlighted the essence of the workshop. She posited that the workshop is timely when viewed against the backdrop of the loss of lives from the lead poisoning incidence which occurred in Nigeria recently due to gold mining activities. She re-echoed the environmental and health impacts of mercury use by ASGM. She stated subsequent to the establishment of the UNEP Global Mercury Partnership in 2008, Nigeria joined the partnership in some identified four key areas and established a national expert working group on mercury to advice government towards developing appropriate strategies to address the adverse effects and risk of mercury exposure. She went on to highlight the various measures taken by the government at sanitising the ASM in Nigeria. She concluded by expressing the sincere appreciation of the Nigerian Government to the different bodies who have supported the hosting of the workshop financially and logistically.

10. Mrs. E. Emuren, the Permanent Secretary, Ministry of Mines and Steel Development of Nigeria welcomed the participants to Nigeria. She gave an insight into the commitment of the Federal Government of Nigeria at repositioning the mining sector for accelerated development especially within the context of safe and environment friendly mining operations. She emphasised the importance of the workshop in view of the recent lead poisoning incidence in Zamfara state, Nigeria. She painted a brief picture on the use of Hg by artisanal miners and its resulting effects on the miners, their families and the communities. She stated that over 90% of solid mineral production, including gold, in Nigeria is done by ASM and that these miners are challenged by lack of appropriate technologies and methods which results to their being exposed to hazardous chemicals such as mercury, lead, arsenic amongst others. She expressed her belief that the workshop would no doubt spawn innovative ideas in gold ore processing for adoption by the local ASM. She briefly mentioned that alternatives such as the use of borax as substitute for mercury are currently being studied. She concluded by commending the organizers of the workshop.

11. Mr. Emman Epongo of the United States Embassy, Nigeria also welcomed the participants and delivered the goodwill of the US Government to them.

12. Engineer A. Ajani of the United Nations Industrial Development Organisation (UNIDO), Nigeria in his address expressed the appreciation of UNIDO for being part of the workshop. He emphasised the timeliness of the workshop and informed that UNIDO has been active in organising workshops especially in Asia and Latin America towards combating the global issues emanating from artisanal and small scale gold mining. He stated that the low level of awareness of the hazards of mercury and the high prevalence of poverty are amongst the factors compounding the problems posed by improper gold mining practices globally. He went on to highlight related programmes currently being promoted by UNIDO towards the production, use and management of chemicals. He posited that UNIDO is the most experienced UN agency

involved with the global mercury project and mentioned various ongoing projects in this regard. He congratulated the organizers of the workshop for its timeliness.

13. Mrs. Brenda Koekkoek, Programme Officer, UNEP Chemicals, welcomed the participants and briefly mentioned the importance of the workshop especially as various treaties are currently being negotiated globally. She said the discussions from the workshop will serve as an essential input from Africa into the formulations of these treaties.

14. The workshop was co-facilitated by Professor Babajide Alo of the Department of Chemistry, University of Lagos on behalf of the Federal Ministry of Environment, Nigeria and Ms. Brenda Koekkoek of UNEP.

15. Opening ceremony was declared closed by 10:55am.

II. Session 1: Introductory Remark by UNEP

16. The first session focused on the overall context of mercury use in ASGM and the development of a global mercury treaty negotiation. It was facilitated by Ms. Brenda Koekkoek.

17. Ms. Koekkoek said the objectives of the workshop included the raising of awareness for regional collaboration and cooperation on ASGM and also to develop momentum for subsequent regional and national action plan follow-up. She went on to state that the agenda of the meeting include an overview of mercury in ASGM; technical, legal & social, financial issues and evolved regional consideration and plans. She thereafter gave a graphic presentation of the different anthropogenic sources of mercury emissions to air in 2005 stating that mining contributes a third of these emissions and ASGM being a major culprit. She declared that in addressing this, UNEP has proposed two main programmes; negotiation of the legally binding instrument on mercury and actions under the global mercury partnership.

18. She informed that UNEP was given a mandate by its Governing Council in 2009 to develop a treaty by 2013 which will come into force and implementation from 2014-2017 with scheduled Intergovernmental Negotiating Committee (INC2). She thereafter highlighted the expected provisions of the treaty with key elements including a reduction and eventual elimination of mercury use in ASGM amongst others. She concluded that time is of essence in eliminating the threat of mercury globally.

III. Session 2: Presentation of National Situations

19. The second session involved the presentation of national perspectives and was facilitated by Professor Alo. The following presentations were given followed by comments, questions and answers from the participants. The summary of this session is as presented below:

Presenter	Organisation/Country	Title of Presentation
Mrs. Abiola Olanipekun	Federal Ministry of Environment, Nigeria.	Artisanal and Small Scale Gold Mining in Nigeria.
Mr. O. C. Azubike	Ministry of Mines and Steel Development, Nigeria	Use of Mercury in Artisanal and Small Scale Gold Mining in Nigeria.
Mr. Alieu Jawo	Geological Department of the Gambia	Gold in the Eastern Region of Gambia and the Possible Impact of Mercury.
Ms. Meaza Tamrat	Ministry of Mines, Ethiopia	ASGM in the Federal Republic of Ethiopia.
Mr. Abayomi B. C. Grant	Environmental Protection Agency, Liberia .	An Overview of Artisanal Mining in Liberia.

1. Nigeria

i. Artisanal and Small Scale Gold Mining in Nigeria

20. Mrs Abiola Olanipekun of the Federal Ministry of Environment, Nigeria highlighted the role of ASM in gold mining in Nigeria and the accompanying environmental and health effects. She said ASGM remain the largest anthropogenic source of mercury which could transform to the more potent methyl mercury in the environment and be bio-accumulated by organisms. She informed that consequent to her joining the UN Environmental Global Mercury Programme in 2008, Nigeria focused on mercury contact from chemical products, waste, ASMG and coal combustion with the objective of networking with experts for information sharing and other related activities. She said a national working group of experts has been established to coordinate the nation's plan on mercury. She said the mass death of children under five years old in March, 2010 in Zamfara has been linked to artisanal lead-rich gold ore processing. She stated that an accurate data base on mercury use, development of policy and regulatory reforms, risk management plan, adoption of environmentally friendly technologies and encompassing awareness policy are strategies being explored to reduce the use of mercury in ASGM in Nigeria.

ii. Use of Mercury in Artisanal and Small-Scale Gold Mining in Nigeria

21. Mr. O. C. Azubike, The Director, Artisanal and Small Scale Mining Department in the Ministry of Mines and Steel Development, Nigeria presented background information on the history of gold mining in Nigeria and various efforts by government at regulating the activities of informal miners. He informed that legislation is now in place to regulate the activities in the industry with the promulgation of the Mineral and Mining Act of 2007 whose main requirement amongst others is for ASM miners to form mining cooperative which will serve as the intervention vehicle for most of the government assistance to the sector. Services such as extension services, finances, EIA studies are now being offered to ASM. He said the present Act recognises both artisanal and big scale miners with divisions such as sub-mechanised and mechanised miners. He also mentioned borax as one alternative technology being studied to replace mercury in ASGM. He advanced that there was presently no data on the amount of gold being mined in Nigeria and although mercury is being used by ASGM in Nigeria, the level of usage is not available.

22. In the ensuing discussion, Susan Keane of the US Natural Resources Defence Council asked if there were any legal limits of mercury use in mining in Nigeria and the current price being paid for gold. In response, Mrs Olanipekun said no limit currently exists for mercury use in ASGM in Nigeria or any ban on mercury use in place at present. Mr. Azubike said he could not say specifically what the cost is as the ministry is not involved in any gold transaction and has no record now. Professor Salvador Mondlane from Mozambique asked if the miners are required to produce an environmental management plan (EMP) before they are legalised and the number of extension workers engaged by the ministry. In response, Mr. Azubike said the ASMs are presently not required to present EMP but assistance is offered at the point of registration. On the second question, he said that there are 8 extension groups currently engaged by both the World Bank (6) and the Ministry (2) in this regard.

23. Suggestion was offered by Laura Barreto from the Alliance for Responsible Mining-NGO, that though EIA need to be undertaken even for small scale miners, this could nevertheless be in a simplified form and if there is any attempt to carry out a geological survey of the mine area. Mr. Azubike said the idea of a simplified EIA has been raised and the proposal is being looked into. On geological survey, Mr. Azubike said work has been started on exploration services in the South East of Nigeria and the urge is to continue provided funds are available.

24. Prof. Ayolabi Elijah, Head of Geosciences Department, University of Lagos, Nigeria observed that the risks at some of the mining sites shown in the presentations are too great, necessitating the need for introduction of superior technology to reduce these risks. He also said most of the jobs being given out to foreign companies by the Ministry of Mines and Steel Development in Nigeria could be better handled by local experts. Additionally, he said there seems to be a big gap between the arms of Ministries and the Nigerian Geological Survey Agency involved in mining issues and that the lack of knowledge of the reserves of mineral resources in Nigeria is a major deficit that could be easily addressed locally if government encouraged working relationships between the various arms of government. He went on to query how there may not be conflict if the same mining sites being exploited by ASGM miners is leased to big scale miners. Responding, Mr. Azubike said anybody carrying out mining activities on someone else's property title is carrying out an illegal activity. On expert engagement, he said the Ministry usually put out adverts prior to the engagement of experts but foreign firms mostly respond. He further added that to encourage the local experts, the foreign firms are mandated to have a local firm before they are given any job. He said a working relationship presently exists between the Ministry and Geological Survey as all the data presented were sourced from them.

25. Alh. Sani Shehu, the President of Nigerian Miners Association, said there used to be Mine Police whose activities were less efficient at curbing illegal mining than what is being witnessed presently using the persuasive approach. He asked what the Ministry is doing in tapping into the potential of using coal for energy and at the same time avoiding the hazards of mercury since it could also be released through this source. Responding, Mrs Olanipekun said the Ministry of Environment is already collaborating with the Power Holdings Company of Nigeria (PHCN) in this regard and that tests would be carried out to determine the level of possible exposure to mercury from coal before it could be exploited. Professor Alo said Nigeria coal is only being suspected to contain undue level of mercury and that this poses a challenge to researchers to determine the content and level.

26. Dr. Oumar Cisse of SAICM, National Focal Point, Mali asked if any assessment had been done on the comparative technology, including costs and use between mercury and borax in ASGM. Mr. Azubike said the study is still at its earliest stages and is ongoing.

27. Mr. Leslie Adogame from Sustainable Research and Action for Environmental Development (SRADeV Nigeria) inquired on the scope of the EIA currently being proposed in the mining act. He proposed that instead of focusing on EIA, environmental assessment (especially for ASGM) should be looked at just to know the state of the environment. He also expressed his fear on the conflict that may develop between the big scale miners and the artisanal miners as currently being witnessed in the oil and gas sector. Mr. Azubike responded that the issue of EIA is legislative and may take time to reform. He emphasised the fact that the mining industry cannot develop without the big players but that nevertheless, the big and small scale players are being encouraged to work together whereby the artisanal miners could exploit the marginal fields of the big scale miners' lease.

2. The Gambia

Gold in the Eastern Region of the Gambia and the Possible Impact of Mercury

28. Mr. Alieu Jawo from the Geological Department of The Gambia gave background information on the gold mining activity in The Gambia. He identified the eastern region of The Gambia as the centre of gold activities. He said officially, mining is not currently taking place in The Gambia but averred that due to the geographical location of The Gambia, inter-boundary ASGM activities is suspected to be taking place across eastern Senegal and Alohungari and Sabi areas of The Gambia. He emphasised that the mining currently taking place is mostly illegal and more as a result of trans-border activities from Senegal and Mali. The gathering was also informed that The Gambia itself is built around the River Gambia and is concerned about mercury introduction into this important water resource.

29. In the ensuing discourse, Mr. Azubike noted that as mining may not have commenced properly in The Gambia it has been in Senegal, he therefore counselled that the identified gold deposit areas in The Gambia are properly monitored to check unregulated ASGM from across the border from Senegal, as the miners are ingenious and sometimes elusive. Mr. Jawo said efforts are being geared towards monitoring their activities in the identified region.

30. Professor Olobaniyi of the Geosciences Department, University of Lagos asked if gold prospecting is only being carried out in the sedimentary area or if hard rock areas are included. Responding, Mr. Jawo said the mining activities are all concentrated in the sedimentary deposits. Alh. Shehu said despite all the concern about the effects of mercury, miners will be reluctant to discontinue its use unless a viable alternative is provided. Laura Barreto in requesting for more information on this sector asked if the miners are artisanal or small scale. Mr. Jawo said there are none presently and informed that a 2005 act is presently in operation to regulate mining.

3. Ethiopia

ASGM in the Federal Republic of Ethiopia

31. **Ms. Meaza Tamrat, Ministry of Mines, Ethiopia** informed that about 500,000 ASGM are currently operating in Ethiopia. She said they are primarily land owners and their hired hands and also immigrants from neighbouring countries such as Sudan. She highlighted the various technologies used in artisanal mining in Ethiopia and stated that licensed gold cooperatives and dealers sell the gold to the National Bank of Ethiopia (NBE). She gave a tabular representation of the amount of gold produced and bought by the NBE in recent months and the income generated from this. She said that ASM is included in the national poverty reduction strategy of Ethiopia. She also mentioned that Ethiopia ASM do not use mercury for gold ore processing and stated that there are no conflicts between small and large scale miners as depth of 15 metres determines who get what (>15m for large scale; <15m for small scale). She thereafter gave the various existing legal instruments for regulating the sector. She also listed the various stakeholders in the Ethiopian mining sector. She concluded by giving a brief on ongoing projects and future plans in the gold mining sector in Ethiopia.

32. In the follow up discussion, Prof. Alo inquired if the Ethiopian Proclamation Act was freely available to the public. Ms. Tamrat affirmed that it was available and promised to share copies with all at the Meeting. Dr. Olanrewaju Badiru from the Federal Ministry of Health, Nigeria asked if any mercury is being used in gold mining in Ethiopia and also advised that more emphasis should be placed on safety of the artisanal miners as they seem to be exposed to risks as shown in some of her presentation.

33. Mr. Azubike informed that smuggling is virtually non-existent in the Ethiopian gold industry because the NBE offers 5% more than the prevailing market rate for gold purchase to dissuade smuggling.

34. Responding, Ms. Tamrat explained that the panning technique is mostly used for ASGM in Ethiopia and this did not require mercury.

35. Ms. Laura Barreto of the Alliance for Responsible Mining also informed that they may not use mercury because the gold is present in a coarser form. Mr. Leslie Adogame observed that the amount credited as earning for each miner (\$1.43 per day) seems too low and asked what role NGOs play in the Ethiopian gold sector. She responded that the quoted earning is comparatively acceptable within the Ethiopian context and the country's GDP and that NGOs are not too active in Ethiopia.

4. Liberia

An Overview of Artisanal Mining in Liberia

36. Mr. Abayomi B. C. Grant from the Liberian Environmental Protection Agency in his presentation gave a brief geographical information about Liberia and stating that that gold mining is presently going on in all the 15 divisions of Liberia with an estimate of 30,000 – 45,000 artisanal and small-scale gold miners.. He said the use of mercury has drastically reduced as other techniques such as panning, carpeting and jigging are now being used. He presented graphics on the activities and effects of artisanal mining in Liberia. He also listed the challenges

faced in the gold mining industries of Liberia. He mentioned that regulations are presently being put in place for monitoring of the gold prospecting activities in Liberia. Alh Sani asked about the presence of any existing laws that ban the use of mercury. Responding, Mr. Abayomi stated that mercury has been monitored by the UN since after the war.

37. In the ensuing discussion, Susan Keane asked for clarification on the jigging processes. Laura Barreto asked why mercury use reduced and whether it was banned. Responding, Mr. Abayomi said the reduction came about due to many factors which included cost and availability of other methods and also due to the growing awareness of the global ban of mercury.

38. Laura Barreto cautioned that it may be difficult to know what is actually happening in the field with respect to the use of mercury since there was no effective monitoring. She also advised that since there are still a lower number of miners in comparison to other countries, it could be easier to control the activities in the sector.

IV Session 3: Technical Aspects

39. The technical session was facilitated by Susan Keane of the Natural Resources Defence Council. The technical issues in ASGM were presented as shown in the table below followed by a session of comments, questions and answers after each of the presentations.

Presenter	Organisation/Country	Title of Presentation
Dr. Kelvin Telmer (Presented by Susan Keane)	Artisanal Gold Council	Mercury Use in ASGM: Technical Guidance Document Introduction
Prof. Z. Opafunso	Federal University of Technology, Akure, Nigeria.	Overview of Best Practices and Field Experience in Artisanal and Small Scale Gold Mining in Nigeria.
Prof. Salvador Mondlane	Chairperson, CASM Africa	Gold Amalgamation in Mozambique.
Mr. Aliou Bakum	Consultant Blacksmith Institute, Senegal	The Use of Retorts in ASGM in Senegal
Mr. Haji Rehani	Agenda for Environment and Responsible Development (AGENDA), Tanzania	Reducing mercury exposures and transitioning miners away from mercury Use

1. Reducing Mercury Use in ASGM: Technical Guidance Document Introduction

40. This presentation was done by Susan Keane on behalf of Dr. Kelvin Telmer of the Artisanal Gold Council. The presentation explained that the document was developed following UNEP Governing Council Decision 25/5, paragraph 4, which aimed to strengthen ASGM activities. She listed the structure of the technical guidance document, the format and timing and the field testing in developing the document. These included the Ghana-Zero Hg (direct smelting) and Tanzania (cold vapour) case studies. The content of the technical document was presented.

41. A schematic of the current practices (for alluvial gold mining) was presented and also that of better practices. She went on to present the envisaged best practices. She mentioned that whole ore amalgamation is the worst culprit for the introduction of mercury into the environment whereby the crushed ore is mixed with mercury rather than the concentrate which results in the use of relatively higher amounts of mercury. In improving on this, she said the ore could be concentrated into smaller masses such that the amount of mercury used is lesser.

42. Susan Keane finally listed techniques such as sluicing, panning and vortex amongst others that could be used to concentrate the gold ore. She also listed existing mercury reduction/elimination methods such as the retorts and cold vapour techniques and presented simple concentration devices which could be easily afforded by ASGM miners cooperatives.

2. Overview of Best Practices and Field Experience in Artisanal and Small Scale Gold Mining in Nigeria.

43. Professor Opafunso Zacheus, Professor of Mining Engineering from the Federal University of Technology, Akure, Nigeria gave an overview of the existing picture of artisanal and small-scale gold mining in Nigeria and the process of gold recovery during mining. He presented graphics showing the gold deposit locations and production areas in Nigeria. The various methods and technologies employed locally for ASGM were briefly explained and the attendant environmental and health issues discussed. He highlighted the various problems and dangers of ASGM in Nigeria and opined that factors such as poverty, illiteracy, improper regulations amongst others strongly influenced the continued participation of people in ASGM despite the odds.. He also emphasized that the extensive involvement of women and children in ASGM in Nigeria. The best management practices for ASGM were presented and a strategic plan for mercury-free gold processing methods introduced. Finally, he further stressed on the importance of public awareness and information dissemination and awareness raising to ameliorate the effects of poor mining practices.

44. During the ensuing discussion, Mr. Akin George, the President of the Nigerian Mining and Geosciences Society stated that his concern about the impact on the environment due to ASGM activities arose because of a World Bank study on illegal and abandoned sites which identified 1218 sites in Nigeria with 40 of those sites in dangerous states. He said apart from mercury there are other dangerous oxides associated with gold and thus implored the Workshop to also look at these other possible metal poisoning problems.

45. Mr. Azubike, Director, ASGM, Ministry of Mines said the abandoned mines are mostly the inherited sites from the colonial era and stated that the Ministry has rehabilitation and closure plans for them. He said four mines were remediated in 2010. That presently, no mine lease is awarded without a closure plan. He also said the Ministry is doing its best at disbursing the available grant to the miners along with other facilities being provided.

46. Mallam Umar Bamalli (Nigerian Institute of Geosciences) said it will be important to identify the active ASGM sites in Nigeria and if mercury is still being used at any of the sites as this information was not available.

3. Gold Amalgamation in Mozambique.

47. Professor Salvador Mondlane, the Chairperson, CASM Africa from Mozambique gave background information on ASGM in Mozambique. He presented the various phases of ASGM including pre-amalgamation phase, amalgamation stage (which could free up to 60% of mercury into the atmosphere) and the burning stage using different retorts types. The types vary as much as the different countries of origin. He explained that despite the inventions of these various retort devices, artisanal miners are still reluctant to use them due to several reasons. He then gave a schematic of the possible solutions to mercury pollution and existing mercury reduction technologies.

48. Mr. Azubike asked if other options have been considered aside from mercury for gold ore processing. Responding, Mr. Salvador explained that in using the borax option, the technology is aimed at lowering the melting point of gold but said the technique is far from being perfected.

49. Mallam Umar Bamalli(Nigerian Institute of Geoscience) asked if Prof. Salvador is aware of a technique developed in South Africa but tested in Mozambique and Tanzania called the igoli process. He answered that it was basically a centrifuge concentration device which was a bit costly but presently abandoned due to funding.

4. The Use of Retorts in ASGM in Senegal

50. Mr. Aliou Bakum, Consultant, Blacksmith Institute, Senegal spoke on mining in Senegal. He said there are approximately 20,000 persons directly involved in mining in Senegal and 50,000 indirectly. He said the sector is mostly informal and some of the gold mining involved mercury use while others do not. He said Senegal is now developing a national action plan for gold mining as there are issues concerning the use, sources and the dangers of the mercury. He presented pictures of an awareness programme on mercury and showed a local retort technique for control of mercury used with supervision from the involved agencies working on educating the small scale miners. He said the programme and meetings are also used to garner information on the level of mercury (Hg) being used and their sources. He gave information on the organisation of the miners, the number of retorts and sites covered. By using the retorts in this way 18,997g of mercury was recovered (from the 85,690g used) . Overall, he said 62,960g of mercury was lost to the air, soil and other environmental media. Nevertheless, he said the initial success of the use of the retort could be built upon for better results. He gave a list of the supporting bodies for the mercury reduction programme in Senegal.

51. Laura Barretto said Mr. Aliou's presentation showed that if the retorts are available and the miners were convinced to use them, a lot could be achieved. Leslie Adogame, SRADev Nigeria, said that the success recorded in Senegal demands a massive awareness on the part of the stakeholders and that it should be a take home message for participants at this workshop. Susan Keane added that she was impressed with the intense commitment to persuade miners to make use of the retorts.

52. Following this presentation, the sessions of Day One of the workshop were ended at 6:20pm with closing remarks by the co-facilitator- Prof B.I. Alo.

DAY TWO

53. The Day Two of the workshop commenced by 9:15am. Presentation on the technical issues in ASGM mining were concluded with a presentations by Haji Rehani from AGENDA, Tanzania and a review of the recent Zamfara ASGM incidence in Northwest Nigeria.

I. Technical Session (Contd.)

5. Reducing Mercury Exposures and Transitioning Miners Away from Mercury Use

54. Haji Rehani of the Agenda for Environment and Responsible Development (AGENDA), Tanzania presented the use of various technologies for ASGM in Tanzania. He said though there was an Act permitting the legal importation of Hg in Tanzania, no part of the law permitted its use for ASGM. He said his NGO- AGENDA was presently involved in training and awareness of the ASGM miners. He informed the Workshop that though the miners acknowledged the dangers of mercury, they are short of alternatives. He showed the pictures of fume hoods already in use for gold ore processing and said the fume hood could capture more than 62% of the mercury used by miners and 72% by the gold shops. He gave an outline of the process involved and listed the accomplishment of AGENDA. **On the use of borax, he said it's been found to be more expensive, less selective and requires more heating than mercury.**

55. During the follow up discussion, he put the possible cost and life - span of the fume hood at around 150 US dollars (as most of the materials for making it are sourced locally except for the blower) and that it lasts for more than a year with a very high return. He emphasized that the user miner could break even after a month of purchasing the hood.

56. Mr. Azubike posited that it seems more emphasis is being placed in Tanzania on the use of fume hoods for achieving mercury reduction and that the use of borax technology is still not well developed. Haji Rehani answered in the affirmative.

57. Mr. Leslie Adogame, SRADev Nigeria said it will be very useful to have a compendium of all the technologies that have been presented so far in the workshop to assist in formulating an action plan. Susan Keane confirmed that an ASGM technologies document is planned to be provided at the end of the month which will include those from the other jurisdictions and that the document will be enumerating these technologies.

58. Alhaji Sani said challenges still remain as to the viable alternatives to mercury as the borax option is still in its developmental stage. He subsequently challenged African geoscientists and mining engineers to undertake further research on workable alternatives.

59. Haji Rehani advised on the need to involve the miners when a new technology is being proposed so that they can easily accept any proposed change or innovation.

60. Olori Babade, Director, Pollution Control, FMENV asked which technology is more prevalent in Tanzania and the existing regulation and if there is any conflict between the miners and the government. Responding, Haji Rehani said the fume hood is what is being mostly used due to its recovery ability and the possibility of mercury re-use. He said no conflict exists between the miners and the government as they are licensed and they pay their royalty thereby getting technical and financial support from the government.

II. The Zamfara State, Nigeria Lead Poisoning from Mining Incidence 61.

Presentations on the recent lead poisoning incidence at Mining sites in Zamfara State of Nigeria were made as shown in the table below followed by comments and questions from the participants.

Presenter	Organisation/Country	Title of Presentation
Mr. C. U. Azubike, Director, ASM,	Ministry of Mines and Steel Development, Nigeria	Updates on the Lead Poisoning Incident in Zamfara State, Nigeria
Dr. Henry Akpan (Presented by Dr. Olanrewaju Badiru)	Federal Ministry of Health, Nigeria.	Overview of Lead Poisoning Outbreak Response in Zamfara State
Ms. Meredith Block	The Blacksmith Institute	The Zamfara Incident: Lessons Learned

1. Updates on the Lead Poisoning Incidents in Zamfara State, Nigeria

62. Mr. C. U. Azubike of the Ministry of Mines and Steel Development, Nigeria in his presentation showed the geographical location of Zamfara State, Nigeria and gave some information on the legislative structure of the Federal Republic of Nigeria. He said the incidence started in two local government areas of the State namely Anka and Bukkuyum in March 2009 where there had been illegal mining activities. He said a team on routine immunization in the communities discovered a high number of deaths in children under five years old in these areas and blood samples obtained from the children in the area were analysed in Germany. The samples showed that there were sudden increases in the blood lead levels of the villagers. He opined that mining operations were immediately stopped and site inspection commenced with assistance from the international community.

63. He mentioned that a report was sent to the Federal Executive Council of Nigeria and a committee was immediately set up to manage the incident. He said though mining has been going on since the 1940s in the areas, the matter got out of hand when the miners introduced domestic grinding machines in their respective dwellings rather than using the general

processing centre and also magnified the problem by the introduction of ores from a particular mine which had a strange combination of gold-lead and arsenic (Au-Pb-As) and other toxic metals. Grinding the ore especially in domestic settings resulted in the widespread movement of toxic dust which were inhaled and ingested through hand to mouth contact with children being mostly affected.

64. He mentioned that boreholes were provided as part of measures to contain the incident as village surface water had been polluted from contaminated run-off and since the ground water table was found not to be affected. Widespread awareness programmes were also carried out to sensitize the villagers and extension officers were deployed to the field to guide the miners. He said top soil remediation has been undertaken in some of the villages but others are still yet to be done namely Bagega town.

65. He thereafter highlighted the lessons derivable from the incidence to include early dissemination of reports on any incidence and formalisation of the illegal miners to enhance regulating their activities amongst others. In conclusion, he expressed appreciation to the various organisations who responded massively to the disaster occurrences.

2. Overview of Lead Poisoning Outbreak Response in Zamfara State

66. Dr. Olanrewaju Badiru delivered the presentation on behalf of Dr. Henry Akpan (CCE) of the Epidemiology/HER Division of the Federal Ministry of Health, Nigeria. He gave an insight into what lead poisoning means, sources of lead poisoning and its effects on humans. He said Medecins Sans Frontieres (MSF) reported the very abnormal deaths of children under five years old in these communities of Zamfara State and the areas were noted to be around locations involved in artisanal gold mining. He said the path of exposure of those affected include inhalation of contaminated dust, oral ingestion of particles especially by children and through breast feeding.

67. He informed that the levels found in blood samples (109.7 – 370 µg/dL) far exceeded the 10µg/dL accepted levels by WHO. Also soil samples from the areas contained up to 10,000ppm of lead in soils as compared to the 400ppm accepted levels by USEPA. He then outlined how the problem was contained. He listed the challenges faced by the team on ground such as the reluctance of the villagers to relocate from affected sites. He stated that so far, only few villages have been remediated with Bagega, the largest village, still yet to be remediated.

3. The Zamfara Incidence: Lessons Learned

68. Ms. Meredith Block, Program Director from the Blacksmith Institute introduced the Institute and outlined their global interest. She said the Blacksmith Institute estimated that about 400 children died from the incidence with the children being under the age of five and the source of exposure mainly through contaminated dust. She listed the interventions made by the Blacksmith Institute to include the building of two hospitals, treatment of the affected children through chelation using appropriate drugs and remediation of affected contaminated villages. Also training and awareness programmes were carried out for the local people to continue the remediation and treatment protocols.

69. She mentioned that a drastic reduction in the recorded death has been achieved but more still needed to be done as some villages still remain untreated. She stated the lessons learnt from the incident to include the fact that information should be made available to the locals and their

input encouraged. She added that further remediation should be carried out until safe practices are employed.

70. Most importantly, she advised that the government should take up a leadership role in managing this incidence. She concluded by acknowledging the input of various governmental and non-governmental agencies in managing the crisis.

71. Reacting to the presentations, Alhaji Sani, President, Miners Association asked if it was the Blacksmith Institute that did the remediation or the Zamfara State Government as he had been told by the presenter that the former undertook the cost of the clean up so far done. Mr. Azubike said the Zamfara State Government might have been involved in some composite intervention. Ms. Meredith directed participants to the UN website for further questions on the financial implications of the incident.

72. The presentation led to several interventions and questions. Dr. Omar Cisse asked if any test was conducted on the chronic symptoms of the lead contamination and if any animal husbandry were also affected. Professor Salvador from Mozambique asked what could be happening to those not treated. Questions on the effects of the drug used for the treatment of those affected and whether tests on houses were also carried out since houses are built in these areas with mud materials obtained from soils from the same field areas. Also the nature of deposits that could contain such dangerous combinations of metals was inquired. Susan Keane asked if there were any other locations having this type of deposits and also if there were any follow up observations on the treated children with respect to possible after effects.

73. Prof. Opafunso asked if any test has been conducted on the food chain and who is in charge of the situation. He also asked whether funding has now been appropriated for managing the incident. Mr. L. Adogame asked about what interventions had been put in place to follow up on the variously outlined processes and the reason for the delay in presenting the report of the Federal Ministry of Health on the incident.

74. Responding, Mr. Azubike said no funding has yet been appropriated for the Zamfara incident. He said some geological survey results exist for the affected areas and that the enforcement of the “stop work” order of the Ministry of Mines and Steel was difficult to monitor due to the high insecurity of the mining sites.

75. Mr Adekanmi from the Nigerian Geological Survey Agency said the Agency had carried out geological studies in the affected areas especially to investigate the unusual metal ore combination and that they were still awaiting the results of samples sent out for analyses. Ms. Block said a lot could be improved upon by personal hygiene and said the avoidance of the possibility of recontamination depends on monitoring and sensitisation of the affected areas and advised that mining should be moved beyond the villages.

76. On possible symptoms, Dr. Badiru said for chronic exposure, symptoms include mental retardation, reduced control amongst others and if the level is high, the neurons break down leading to eventual death. He also advised that miners should have safety apparels on when mining. On side effects of the drugs, he said it is low. He said no investigation has been carried out on possible poisoning from other heavy metals.

III. Session 4: Legalization and Formalization of ASGM in Anglophone West Africa

77. This session was facilitated by Maria Laura Barreto and involved presentations on various national legal frameworks for ASGM in the region followed by comments and questions from the participants.

Presenter	Organisation/Country	Title of Presentation
Laura Barreto	Alliance for Responsible Mining	Formalisation of ASGM: Is it Possible to achieve?
Ms. Meaza Tamrat	Ministry of Mines, Ethiopia	A Regulatory Framework for Artisanal and Small Scale Gold Mining
Engr. Charles Uka	Ministry of Mines and Steel Development, Nigeria	Legalization and Formalization of ASGM in Anglophone West Africa- Nigeria Case
Dr. Oumar Cisse	SAICM National Focal Point, Mali	Legalization and Formalization of ASGM in Francophone West Africa

1. Formalisation of ASGM: Is it Possible to Achieve?

78. Laura Barreto **in her presentation** showed that small scale gold mining was going on in virtually all developing countries. She presented data to show that ASM contributes a significant proportion to the amount of mine products globally and also a major source of employment and the need for governments to recognise that ASM is an important aspect of the world's economy. She said ASM is possible because the deposits are superficial and easy to access and therefore should not be described as illegal or any other unwholesome name so that it could be easily formalised and controlled.

79. She highlighted the effort of UNEP at encouraging the formalisation of ASM worldwide. She presented the case of Tanzania drawing attention to the defects in the licensing conditions and possible alternative considerations. She went on to present some lessons for effective ASM formalisation.

80. She posited that ASM as a definition should be reviewed as a practical necessity to distinguish the different types of mining and to recognise the special characteristics of ASM. She also said the legalisation of ASM should be in phases. She also advocated for the avoidance of impositions or unnecessary restriction of rules or regulations without consultation with the miners. She called for the allocation of special areas for the ASGM mining projects as ASGM constitutes a fundamental tool towards poverty alleviation and that flexibility should be encouraged in the legislation and monitoring process.

81. Commenting, Mr. Azubike said lumping ASM activities together was always difficult. He said in Nigeria there are six levels with the first four levels being allowed to form cooperatives while the other two levels are made to formally register their companies with the Corporate Affairs Commission as legal entities.

82. Dr. Badiru opined that it may be difficult for government to render assistance if there are no cooperative societies as obtains in some Latin American countries. Mallam Umar said the case-studies of Africa and Latin America may differ as in Africa most ASGM miners are immigrant workers while this may not be the case in Latin America.

83. Following Prof. Opafunso's intervention, Alhaji Sani also strongly suggested that subtle means be applied in reforming the informal mining sector.

84. Laura Baretto said it is not enough to have a classification as outlined by Director Mr Azubuike without a mining title and advised that licences should be given out to all ASM miners. She said the diversities of the ASM should be recognised and taken into account during licensing. She said she agrees that ASM miners need a legal entity which could be in other forms other than solely cooperative societies and most importantly that for ASM to grow, they need to be organised. On the issue of immigrant workers, she said they also have a right to quality life and if this could through ASGM, why not? She said maintaining the illegal notion of ASM is expensive and this could change if other subtler approaches are used.

2. A Regulatory Framework for Artisanal and Small Scale Gold Mining

85. Ms. Meaza Tamrat of the Ministry of Mines, Ethiopia informed that ASM miners in Ethiopia are organized into cooperatives who can request for mining licence and are given titles for 5,000-10,000 sq. Metres of the mining areas. They pay 8% royalty and can access loans from micro finance institutions. She listed some challenges of ASM in Ethiopia and listed future programmes in the sector. Ms. Meaza Tamrat finally said there were three types of licences and also listed the various laws and policies governing the operation of ASM in Ethiopia.

3. Legalization and Formalization of ASGM in Anglophone West Africa-Nigeria Case

86. Engr. Charles Uka from the Ministry of Mines and Steel Development, Nigeria said ASGM is beginning to have a legal framework in Nigeria for the first time. He said mining cooperatives and quarry associations are now being formed and up to 1000 applications are presently being processed. He said verification is carried out to determine the existence of such bodies and monitoring is also carried out for effective control.

4. Legalization and Formalization of ASGM in Francophone West Africa

87. Dr. Oumar Cisse gave background information on ASGM in Mali and the history of gold mining in Mali. He presented the hierarchical organization of gold mining in Mali which has been in place a long time ago. He said ASGM is controlled under law No 99-032 and put the number of ASGM at around 200,000 with members of the existing gold mining association working informally. He emphasized that the informal ASGM in Mali is organised to some extent. He related some of the discussions carried out in the sub-regional Francophone West Africa ASGM workshop and listed elements in the national action plan of the workshop.

88. During the ensuing discussion, Laura Baretto asked who gives the financing in the Ethiopian case. Meaza said the regional micro-finance institutions give the loan and they were in turn linked with the National Bank of Ethiopia for credit facilities. Mr. James Akujobi, Nigerian Emergency Management Agency (NEMA) asked how the beneficiaries are able to pay back the loans. Mr Azubike chipped in that the loans may be grants not meant for repayment.

5. Breakout Sessions and Group discussions

89. Participants were subsequently divided into two break-up groups 1 and 2.

Grp. 1- Salvador Mondlane from Mozambique; Repertoire – Mr. Leslie Adogame

Grp. 2- Haji Rehani from Tanzania; Repertoire – Professor Z. Opafunso

The groups deliberated on the environmental and technical intervention for ASGM questionnaire using the completed questionnaires provided. (see Appendix I, II and III)

IV. Session 5: Financing Dialogue

90. This session was facilitated by Susan Keane. Presentations were made on different financial intervention options available for the ASGM sector. Comments and questions from participants followed thereafter.

Presenter	Organisation/Country	Title of Presentation
Utsu L. Adie (Presented by Charles Agbeze)	Sustainable Management of Mineral Resources Project, Ministry of Mines and Steel Development, Nigeria	Financing of Mineral Resources Project (The SMMRP Experience)
Dr. Oumar Cisse	SAICM, National Focal Point, Mali	Mali's Experience from SAICM QSP
Susan Keane	Natural Resource Defence Council	Funding ASGM Projects in West Africa
Usman Tariq	Consultant, United Nations Environment Programme	Environment for Development Perspectives: Mercury Use in Artisanal and Small-scale Gold Mining

1. Financing of Mineral Resources Project (The SMMRP – Nigeria's World Bank Project Experience)

91. The presentation written by Utsu L. Adie, Project Head of the Sustainable Management of Mineral Resources Project, Ministry of Mines and Steel, Nigeria, was presented by Charles Agbeze, consultant to that Ministry. The presentation gave a brief on the development of the mining sector in Nigeria. He listed the objectives of this World Bank project currently ongoing in Nigeria and its components. He said the IDA gave 120 million dollars and 8.05 million dollars was from the Nigerian government as counterpart funding.

92. He listed the legislative and institutional framework guiding the project and said the project started with requisite baseline studies followed by capacity building and training. He mentioned that the project has been able to carry out the remaining 56% geological survey of Nigerian territory. He outlined the attendant benefits of the project as increased investment and revenue from mining, increased solid mineral production, better mines supervision, improved human capacity. He gave the economic and social issues raised by the Project; the challenges, advice on sustainability and the conclusion and recommendations.

2. Mali's Experience of Financing from SAICM QSP

93. Dr. O. Cisse gave the general objective of the program i.e. the reduction of the use of mercury in ASGM. He gave the objectives and stated that the project total budget is US\$240,600.

3. Funding Sources of ASGM Projects in West Africa

94. Susan Keane gave information on the various projects funded by UNIDO worldwide and a comparative analysis of the ASGM indices in Mali, Burkina Faso and Senegal was shown. She mentioned that these three countries are currently receiving funding for projects from UNIDO and other funding bodies including GEF and France with varying conditions. She gave an outline of the GEF funding proposal and said the World Bank is currently funding Artisanal mining in many countries with a proviso that a certain percentage be set aside for small scale mining. She emphasized the critical importance of countries requesting assistance for ASGM as part of assistance packages directed at the mining sector.

4. Environment for Development Perspectives: Mercury Use in Artisanal and Small-scale Gold Mining – UNEP Study

95. Usman Tariq from UNEP outlined the objectives of the study and that the motivation for the study was the gold rush due to the current increasing value of gold in global markets. The study showed ASGM as a source of livelihood, opportunity for poverty alleviation, and discussed health, environment and social issues related to the sector as well as the link between development and ASGM. He went on to list the opportunities and major challenges in the ASGM sector, financing options available (multilateral and bilateral funding sources etc). He concluded by asking what projects represent model financing techniques.

96. Mr. Adogame asked the SMMRP Project representatives to clarify if the Project or the ASGM sector really received 10 million US Dollars out of the World Bank money and inquired if a brief breakdown of the financial distribution of the funding obtained is available. He also inquired if the project includes a re-settlement policy framework that could be adopted for the Zamfara State incidence and case.

97. The SMMRP representative Mr. Agbeze said the 10 million Dollars was a sub-project to be given as grant and it targeted the cooperative for use for services, training and equipment supply with each cooperative getting 50,000 dollars with 10% counterpart contribution. He said the project has disbursed about 70% of the money so far. Mr Bashir (from SMMRP) said there are no provisions for any resettlement framework in the project plan.

98. Alhaji Sanni said this workshop should call the attention of the Federal Government or minders of the World Bank project to take action on the Zamfara issue urgently since children are at risk of dying any time soon in villages not yet remediated. Dr Badiru also advised that the post-incident activities including remediation in the Zamfara Incidence should be integrated into the World Bank project to assist in the treatment and resettlement of children as lives are more important than any physical issues.

99. The sessions for Day Two were brought to a close by Brenda Koekkoek who closed the session by 6.15pm.

DAY THREE

I. SESSION 6: REGIONAL PRORITY SETTINGS AND NEXT STEPS

100. The day's session was facilitated by Professor B. I. Alo

1. Strategic Planning: Reducing Mercury Use in Artisanal and Small Scale Gold Mining

101. Ms Brenda Koekkoek presented the strategic plan on global mercury reduction. She said that the Mercury treaty being currently negotiated will be developed between 2010 and 2013, with the treaty expected to come into force around 2017. She said the major component of the treaty will be the reduction of mercury use in ASGM in short term and elimination in the long term. She therefore emphasised that strategic planning is a priority of the ASGM partnership as it secures government commitment, promotes a coordinated approach and support future treaties. She mentioned that a regional programme in Asia that included Cambodia and the Philippines is currently underway. The Asia Regional project has the following components (i) review of the Guidance Document (UNEP) and (ii) the drafted National Strategic Plans. She referred the participants to these documents and subsequently highlighted some of the components they should note when drafting their own national plans.

102. The break out groups thereafter presented an action plan for adoption by participants (See Appendix III).

103. The communiqué for the workshop was deliberated upon and a final draft adopted (See Appendix IV).

104. Ms. Brenda Koekkoek thereafter acknowledged the important inputs of all participants and implored them to ensure that the follow-up actions on the issues generated are taken up. She advised the participants to set up National Action Plan drafting committees in their respective countries or region as may be suitable and that seed money in terms of a small grant was available for this purpose.

105. In her Workshop Final closing remarks, Olori Funke Badade, Director, Pollution Control, Fed Ministry of Environment thanked UNEP, the USEPA and the Government of the United States and all participants especially the international experts and visitors on behalf of the Federal Government of Nigeria for their attendance, excellent participation wonderful contributions and stimulating discussions. The workshop was declared closed at 4.40 pm.

APPENDIX I: REPORTS OF BREAKOUT GROUPS

A. Environmental / Technical Interventions

The breakout groups used the table below showing present promising solutions to reduce mercury use and releases to provide answers to some of the environmental / technical intervention questions

Alternatives *	Percentage of mercury use reduction	Dollar Cost **	Obstacles/Barriers
Centrifuge	No mercury used	\$1000-10,000. Average \$4000 for a good ASM centrifuge	Cost, energy, water technical know-how, legal status
Sluice	Pre-concentration prevents whole ore amalgamation	\$50-\$1000	Water (although can be dry too), cost , energy
Retort (various types)	80 to 99%	\$3-50	Time, transparency, volume
Mercury vapor capture system	70 to 90%	\$50	Legal status, technical know-how
Reactivation (salt water and 12-volt battery)	30 to 70%	\$3	None
Direct smelting kit	No mercury used	\$1000	Cost, energy, technical know-how, quantity of material that can be processed

Summary Record of Break out Groups Discussions, Questions and Answers

Ia. Which of the technologies should be promoted?

Participants decided that Sluicing, retorts and the cold vapour techniques should be promoted depending on which of them the ASGM miners are comfortable with.

Ib. Technology with scale-up potential

Participants/Discussants agreed that activities such

i) **TRAIN THE TRAINERS:** Mining co-operatives who were successful in using a technique could be used to train other groups of miners to imbibe the technique.

ii) **AWARENESS –RAISING** through regular stake holders meeting with leaflets and flier distributed

iii) capacity building workshops too should be held

iv) funding of these meetings in the form of transporting the artisanal miners will enable them to attend

- v) pilot demonstrations on the field should be carried out. This demonstration should not be once but many times to ensure the technique is imbibed
- v) equipment should be fabricated locally using locally available materials as this will ensure easy accessibility and continuity.

Ic. Barriers to scaling up include

Funding; non- availability of locally fabricated equipment; replacement parts; lack of skills on the use of the techniques; low output of the technique; non-willingness to change from old methods.

II What technical activities have been undertaken in the region where broad sharing on information would be of learning benefit to all countries?

- i. Periodic mining conference to exchange ideas as usually held in Durban , South Africa and Canada
- ii. Deployment of extension workers
- iii. ECOWAS mining ministers conference last held two years ago as an ideas and policy exchange forum
- iv. United Nations Economic Commission for Africa (UNECA) mining vision and ASM is included in it. Here theAfDB is willing to make funds available.
- v. CASM (community and small scale mining) is a platform for knowledge exchange
- vi. The Nigeria Mining and Geosciences Society which holds its conference every year is another platform and foreigners are usually present.

III. What on ground activities have been or are being undertaken in the region that is facilitating miner's access to financial resources?

Processes for Legalization or formalization of ASGM in the region and formation of cooperatives

IV. Mining and geology research and training institutes in the sub-region

- i. Engineering School of Technology, Mali
- ii. Over twenty universities and training institutions in Nigeria in Mining or with Mining curricula including Department of Mining Engineering, Federal University of Technology, Akure; Department of Geosciences, University of Lagos, Nigeria
- iii. Nigerian Institute of Miners
- iv. University of Liberia (Dept of Geology)
- v. Mining Community Resource Centre, Jos, Nigeria
- vi. University of Science & Technology, Kumasi, Ghana and numerous others in the sub region

APPENDIX II: Formalisation of ASGM

Without formalized ASGM, it is challenging to address the issue of mercury use in the sector. There is an overall need identified for formalization of miners across the region. The Table below summarises the status of legal frameworks in countries of the region and presents challenges to implementation and /or enforcement of the policies and regulations.

Country	Does your country have a legal framework policy for ASGM miners? What is the legal status of miners?	How do the miners access the gold market?
Nigeria	There is an existing Mineral and Metal Policy of 2007 which recognises ASGM. Though ASGM is not yet formalized, formalization is in progress. Also there exist the Mineral and Mining Act 2007 and the Mineral and Mining Regulation 2011	No formal access to the gold market. Middlemen buy the gold from the miners, process and sell them to gold shops especially in neighbouring countries. However there is a plan to set up a formalized market.
Liberia	Expects improvement in the mining sector with the finalization of the National Poverty Reduction Strategy. A National Mineral Policy provides a guiding framework for decision makers in the management of Liberia's mineral resources.	No identified market
Gambia	Has the Mines and Quarry Act	No identified ASGM therefore no existing gold market
Sierra Leone	Information not available	No market is known
Ghana	Transition stage	An existing Precious Minerals Marketing Corporation controls both the formal and informal markets.
Ethiopia	Proclamation for organization into cooperatives...	There is a gold buying program operating through the central bank.
Mali	Miners come from Mali and from other African countries. They are recognised by law. Mining Code of 2009	There are formal and informal buying centres. The gold buyers are from Mali, Guinea and Senegal.
Mozambique	A law taken from the existing World Bank framework which recognises the ASGM is operational	There are the formal and informal market
Senegal	There is an ASGM code in section 40 of the mining law and permits are issued to the miners.	No organized market sector. All transaction is informal
Tanzania	Mineral Policy 1997 and an Act of 2010. Formalization of ASGM is ongoing.	Miners sell to gold shop owners
Summary	Challenges	Funding, lack of manpower in monitoring, frequent changes in leadership at policy making levels and lack of infrastructure

	Opportunities	Job opportunities, crime reduction, empowerment, unique livelihood, poverty alleviation, contribution to global gold economy

APPENDIX III: Brief Regional Context / Overview of the ASGM Issues

Country	Estimated number of ASGM miners	Population of country	Concentrated or spread throughout the country?	How much gold do they produce? What price?	How much mercury do they use? What price?	Current Government Champion *
Nigeria	200,000	140 million	Concentrated in North-western and South-western zones of the country	90 % of mineral production in Nigeria is artisanal.	Not available	Ministry of Mines and Steel Development
Liberia	30,000-45,000	3.5 million	Spread throughout the country	Not available	Amount of mercury used has been reduced in recent years. Limited access to mercury is promoting cleaner technology.	Ministry of Mines
Gambia	Unknown		Eastern region	Not available	No available data	Ministry of Mines
Ethiopia	500,000 (about 10,000 organized in cooperatives)		In 6 regions	5800 kg sold to central bank last year. Payment 45,000 US\$ / kg.	Mercury not used.	Ministry of Mines
Sierra Leone			No available information	No available information	No available information	Ministry of Mines
Ghana			Widely spread	14 tonnes by ASGM	No available information	Ministry of Mines
Mali	200,000			2000-4000 Kg by ASM	Black market for mercury	Ministry of Mines
Democratic	300,000		Widely spread	No available	Banned in the	Ministry of

Republic of the Congo				information	sector but is used informally	Mines
United Republic of Tanzania	400,000			1.076 billion in gold exports in 2009, ASGM about 10 %	No available information	Ministry of Mines
Mozambique	100,000		Most of them are informal	Approximately 600 Kg, All of it is produced by ASGM	Statistics not available.	Ministry of Mines
Senegal	20,000		Eastern region	Approximately 1 tonne	Statistics not available.	Ministry of Mines
Summary points						

a) Common issues across Countries in the Region

- Lack of baseline data.
- Child labor is prevalent in many regions.
- Lack of formalization in most countries is a barrier to miners improving their practices

b) Additional Information from Similar Forums

1. Democratic Republic of the Congo

Mining is considered an important sector in the economy of the country. The mining sector contributes to 71% of the GDP and 86% of exports. ASGM is mainly informal, using rudimentary instruments and methods, such as pick and shovels. ASGM contribution to national economy is around 5%. There is a project for establishment of a Mining Fund that would assist mining communities in the establishment of social infrastructures. According to the gold miners, the alternative methods to amalgamation do not produce good results. The alternative methods to amalgamation include gravity concentration, grinding, sluicing, pre-concentration, drying and blowing.

2. Ghana

In Ghana, ASGM is widely spread in Greenstone belt areas and in river basins and catchments. The ASGM operations in Ghana are classified by size and by tonnage handled per year. In Ghana only 5% of ASGM miners comply with law. The government has created the Precious Minerals Marketing Corporation (PMMC), an entity responsible in channelling the gold from informal and formal operation into the official channels. The ASGM sector in Ghana faces various challenges, including the conflicts due to encroachment of ASGM into Large Scale Mining claims, poor organization, lack of finance and technologies, lack of reclamation of mined

sites and conflicts on mineral rights. Government intervention involves designation of ASGM areas, provision of financial assistance to ASGM, mercury abatement programmes, decentralization of the licensing and cadastre departments.

3. Mali

The gold miners use crushers, sluices and produce a concentrate that is amalgamated with mercury and the amalgam is burned in open air or kitchens. The source of mercury is not clear, however reports indicate that the traders (buyers) bring mercury and, there is black market circuit on mercury. The Government of Mali is reviewing the mining law and in the new draft ASGM has been given a special attention. The Government is quite supportive to ASGM and understands its importance in the rural development. In Mali there are no studies of the environmental problems caused by mercury used by ASGM. Mali has a project for mercury abatement together with UNIDO through the Quick Start Programme of the Strategic Approach to International Chemicals Management.

4. Mozambique

ASGM miners are mainly men, 30% are women and children who tend to perform activities such as transport, wash and panning of ore. In most cases ASGM activities are practised during the dry season while in the wet season most of the people resume agricultural activities. The sector is informal with precarious bookkeeping, lack of basic economic knowledge of the activity and market problems. In Mozambique there is a Mining Fund (Fundo de Fomento Mineiro), which buys the gold product from ASGM at the market price, but it is competing with other buyers. The Government is conducting projects that aim at organization and formalization of ASGM. Environmental education is a tool that can be used to educate the miners in implementation of best mining practices.

5. Nigeria

There was a baseline survey in 2005 and it was revealed that ASGM miners use a combination of mercury and cyanide extraction. There is specific ASGM department in the Ministry of Minerals and Energy and its mandate is to assist the ASGM sector countrywide. There was a World Bank project that assisted ASGM in formalization, formation of ASM cooperatives, financial and technical assistance.

6. United Republic of Tanzania

The main method for extracting gold is the use of mercury which is readily available in the market. Child labor is quite common in ASM sites in the United Republic of Tanzania. The Government assists ASGM by training them on mining methods and processing techniques. In 2007 the Government published a new act in which there is a full section on ASGM. The licensing has been decentralized to regional level and it takes about a month to issue a license.

APPENDIX IV:

COMMUNIQUÉ

Anglophone West Africa Awareness Raising Workshop on mercury in Artisanal Small Scale Gold Mining 8 – 10 June 2011, Lagos, Nigeria

INTRODUCTION

The Anglophone West Africa Awareness Raising Workshop on mercury in Artisanal and Small Scale Gold Mining (ASGM) was organized by the Federal Ministry of Environment, Nigeria, in collaboration with United Nations Environment Programme with financial support from the Government of United States of America Environmental Protection Agency. The workshop was held from 8-10 June, 2011 at the Sheraton Hotel, Lagos, Nigeria.

OPENING

2.0 The workshop was declared open by the Permanent Secretary, Federal Ministry of Environment, Mohammed Sambo Bashar (mni), represented by the Ministry's Director of Pollution Control and Environmental Health, Olori Olufunke Babade. In his welcome address, the Permanent Secretary highlighted the environmental and health impacts of mercury use by ASGM. He stated that subsequent to the establishment of the UNEP Global Mercury Partnership in 2008, Nigeria joined the partnership in four key areas and established a national expert working group on mercury to advise government towards developing appropriate strategies to address the adverse effects and risk of mercury exposure. In conclusion, he expressed the sincere appreciation of the Nigerian Government to the different bodies both at the international and national levels who have supported the hosting of the workshop financially and logistically.

2.1 Goodwill messages were delivered by the Permanent Secretary, Ministry of Mines and Steels Development, Mrs. E. Emuren, Representative of the Embassy of the United States of America, Mr. Emmanuel Epongo and the Representative of the UNIDO Regional Office in Nigeria, Mr. A. Ajani.

2.2 In her message, Mrs. Emuren gave an insight into the commitment of the Federal Government of Nigeria at repositioning the mining sector for accelerated development especially within the context of safe and environment friendly mining operations. She concluded that an alternative such as Borax as a substitute for mercury is currently been evaluated by her ministry.

2.3 In his goodwill message, Mr. Epongo noted the support of the Government of the United States of America towards efforts to address the reduction of the environmental and health impacts of mercury exposure and contamination.

2.4 Mr. Ajani in his message stated that the low level of awareness of the hazards of mercury and the high prevalence of poverty are amongst the factors compounding the problems posed by improper gold mining practices globally. He highlighted the various programmes being promoted by UNIDO towards the sustainable production, use and management of chemicals. He posited that UNIDO is the most experienced UN agency involved with the global mercury project and congratulated the organizers of the workshop for its timeliness.

2.5 UNEP's representative, Ms. Koekkoek welcomed the participants and highlighted the importance of the workshop in view of the ongoing negotiation for a global legally binding mercury treaty. She said the discussions from the workshop will serve as essential inputs from Africa into the development of the treaty.

3.0 PARTICIPATION

The Workshop was attended by sixty seven (67) participants from the Governments of Liberia, The Gambia, Nigeria and Mali, including International Experts from Mozambique, Ethiopia, Senegal, Canada, Tanzania and United States of America. Other experts from Nigeria include those from the Academia, Miners Association of Nigeria. Government Agencies and parastatals such as the National Environmental Standards and Regulations Enforcement Agency (NESREA), the National Emergency Management Agency (NEMA), Nigerian Institute of Mining and Geosciences, Nigerian Geological Survey Agency and Sustainable Management Of Mineral Resources Project. Non-Governmental Organizations (NGOs) -affiliates of IPEN / Zero Mercury working group, Nigerian Mining and Geosciences Society, the Media and UN Agencies.

4.0 WORKSHOP OBJECTIVE

The Main Objectives of the Workshop were to

- Enhance regional collaboration and coordination through exchange of experiences and lessons learned on a regional level.
- Raise the awareness of governments and stakeholders.
- Build momentum for regional and national action plans.

5.0 PLENARY/TECHNICAL SESSIONS.

5.1 The workshop had extensive deliberations on the following topics, including national situation presentations by Ethiopia, The Gambia, Liberia, Mali, Mozambique and Nigeria:

- Reducing mercury use in ASGM: Technical Guidance Document introduction
- Overview of best practices and field experience in artisanal and small scale gold mining in Nigeria
- Strategic planning for reducing mercury use in artisanal and small-scale gold mining
- Reducing mercury exposures and transitioning miners away from mercury use
- Overview of lead poisoning outbreak response in Zamfara state
- Formalization of ASGM: *is it possible to achieve?*
- A regulatory framework for artisanal and small scale gold mining
- Formalization and legalization of artisanal and small-scale mining in Nigeria''
- Environment for development perspectives: mercury use in artisanal and small-scale gold mining
- Financing of mineral resources project (the sustainable management of mineral resources project experience)
- Funding ASGM projects in West Africa
- Pathways of financial support for mercury reduction projects in artisanal and small-scale gold mining
- Overview of best practices and field experience in artisanal and small scale gold mining in Nigeria.

- A Regulatory framework for Artisanal and Small Scale Gold Mining
- Legalization and Formalization of ASGM in Anglophone West Africa

6.0 OBSERVATIONS AND RECOMMENDATIONS

The workshop noted the following:

- That UNEP Governing Council Decision 25/5, paragraph 4, aims to strengthen ASGM activities. ASGM was a critical focal issue during the INC 2 negotiations in Chiba Japan. Nigeria and Mali represented the Africa region as bureau members at the meeting.
- Nigeria joined the partnership in four key areas and established a national expert working group on mercury to advise government towards developing appropriate strategies to address the adverse effects and risk of mercury exposure.
- The organisation of artisanal and small scale miners into cooperative societies and the evaluation of Borax as a substitute for mercury by the Nigerian Government.
- Across the sub-region, mercury is continuously and predominately used in gold processing by ASGM miners.
- Generally it was recognized, that mercury constitutes a major health and environmental hazard in the sub-region.
- There is a general information gap of the sector, associated with lack of proper coordination of the various institutions responsible for the sector.
- It was also observed that adequate attention by the coordination and supervisory agencies has not been given to the sector to address these problems.
- There are a series of alternative technologies that may replace the use of mercury in the region.
- The low level of awareness of the hazards of mercury and the high prevalence of poverty as major factors compounding the problems posed by improper gold mining practices within the sub-region.
- There was a major tragedy where there was an estimated 400 deaths in children that occurred in Zamfara State in the north of Nigeria as a result of ASGM activities.

RECOMMENDATIONS

1. The need for the development of appropriate and adequate policies and regulatory reforms, accurate data base on mercury use, risk management plan, adoption of environmentally friendly technologies and sustained awareness raising in all the countries in the West African region as strategies for reduction in the use of mercury in ASGM.
2. The need for development of national strategic and action plans by countries in the west African subregion including a regional action plan for the phase out of mercury in artisanal and small-scale gold mining sector.
3. The need for EIAs in a simplified form for upcoming or new mining projects and sector specific environmental management plans for existing artisanal miners, including a sector specific environmental management plan, to be undertaken for small scale mining projects including geological surveys of mining sites.

4. The need for sensitization and awareness raising campaigns focused towards the prohibition of mining, milling and processing in residential communities while enabling miners to continue their work safely.
5. Establishment of National Interministerial Committees on ASGM to oversee issues, including *inter alia* the following:
 - Development of national strategic plans on ASGM,
 - Development and implementation of safe mining practices,
 - Environmental Remediation of contaminated mining sites in each country and
 - Medical Treatment for exposed and impacted communities
6. The need to strengthen enforcement mechanisms of regulatory and monitoring frameworks of each of the countries in the sub-region.
7. The Government of Nigeria should immediately intervene to save the lives of Nigerian children who are facing death threat from lead poisoning in Zamfara State. There is also an urgent need by the Federal Government to reinforce remediation and prevention activities in Zamfara State of Nigeria.

CLOSING

In conclusion, therefore, the participants of the sub-regional workshop wish to draw the attention of governments of the sub-region to the above recommendations.

7.0 The workshop expressed profound appreciation to UNEP, the sponsor of the workshop- the Government of the United States of America, International and Local experts. The workshop also thanked the Permanent Secretaries of the Federal Ministry of Environment and the Ministry of Mines and Steels Development, for their support and efforts in organizing the workshop. The organizers expressed appreciation to all the participants for their commitment, contributions and cooperation during the workshop in enhancing regional collaboration and coordination through exchange of experiences and lessons learned on a regional level.

ADOPTION OF THE COMMUNIQUÉ:

8.0 This Communiqué was adopted by acclamation at 4.35pm on Friday 10th June 2011 at the Sheraton Hotel, Lagos, Nigeria.

