



## STRATEGIC PLANNING FOR ARTISANAL AND SMALL-SCALE GOLD MINING IN ASIA



19 – 21 January 2010  
Richmonde Hotel, Ortigas Center, Pasig City, Philippines



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**Inception Workshop:  
Strategic Planning for Artisanal and  
Small-scale Gold Mining in Asia**

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## Executive Summary

The unabated use and emission of mercury into the atmosphere and the serious adverse effects it brings to human health and the environment is a worldwide concern that requires concerted international action. The Governing Council of the United Nations Environment Programme (UNEP), by its decision 24/3 IV on chemicals management, requested the UNEP Executive Director, working in consultation with Governments and other stakeholders, to strengthen the UNEP mercury programme partnerships by taking a number of steps, including enhancing the artisanal and small-scale gold mining (ASGM) partnership.

In that regard, UNEP initiated regional projects in South East Asia and South America under the Quick Start Programme (QSP) of the Strategic Approach to International Chemicals Management in cooperation with a number of interested partners. One of the projects established under the QSP is the development of a national strategic plan for the ASGM sector.

Artisanal and small scale gold mining is a complex development issue that presents many intertwining challenges. While it is an important source of subsistence to a considerable number of people and help buoys the national economy, it is also beset with large-scale environmental, health and social problems. It is therefore imperative for national governments, in collaboration with concerned stakeholders to develop and implement programs and strategies that will facilitate the effective reduction of mercury and at the same time improve the quality of life of miners and their families. To hasten the migration of miners to cleaner and more sustainable gold production methods and maximize their benefits, it is necessary to improve understanding of the inner workings of the sector, the current mining practices, the motivations and interests as well as barriers for miners in adopting mercury-free technologies in order to facilitate the introduction of appropriate and effective interventions.

The Philippines and Cambodia have flourishing ASGM industries brought mainly by the continuous surge in the price of gold and the discovery of new gold rush areas. The growth of the ASGM industry has also strengthened the demand for mercury. The widespread use of mercury and the current undesirable health and environmental consequences of producing gold from ASGM in the two countries have undermined the sector's significant economic contributions. A mercury inventory initiated by the two governments with support from UNEP in 2008 revealed that a substantial percentage of the annual mercury emission can be attributed to ASGM.

To jumpstart the development of national ASGM strategic plans and contribute to the South East Asia regional project related to protecting human health and the environment from mercury in ASGM, funds from the Quick Start Programme Project of the Strategic Approach to International Chemicals Management (SAICM) was allocated for the conduct of the inception workshop. It is in this context that the three-day inception workshop was organized to draw the active support of various stakeholders identifying and addressing the problems, issues and concerns towards the sustainable development of the ASGM sector.

The workshop was conceived to set the impetus for the development of national artisanal and small-scale gold mining strategic plans for Philippines and Cambodia which will supplement regional efforts to protect health and the environment from mercury in the sector. The plans,

which the participating governments will develop in collaboration with various stakeholders, will include, among other things, a review of legal, educational, economic, and regulatory and enforcement framework. The strategic plan will likewise incorporate budget and workplan as well as potential funding sources and partners for future work.

The inception workshop was principally organized with the following as its specific objectives:

- a. review the overall requirements for the development of the National ASGM Strategic Framework Plan;
- b. review information gathered by countries in the questionnaire and plan next steps;
- c. develop Terms of Reference for the National Steering Committee and add national milestones into the Overall Project Work-plan;
- d. present the current national situations on ASGM;
- e. discuss and review social, legal and enforcement issues; and
- f. enhance regional collaboration and coordination through exchange of experiences and lessons learned.

In order to achieve the above-cited specific objectives, the workshop organized a number of technical sessions/discussions touching on various aspects of ASGM from legal, technological, health, social, trade and basic sectoral profile. To elicit inputs from the participants, a break-out workshop/plenary session was utilized where group members were made to answer questions from the UNEP guidance document. Specific issues and concerns that were raised were threshed out and summarized as suggested next steps and guide questions were laid down for consideration by the two governments in moving ahead with the project.

In conclusion, the workshop provided an opportunity for Cambodia and Philippines to share their experiences and enhanced regional partnership in addressing mercury pollution in ASGM. Most importantly, the discussions on past and ongoing initiatives as well as the proposed technical, financial and policy solutions present an opportunity for collaboration where efforts and resources can be pooled together to meet the challenges ahead. The workshop would however be more fruitful if other important players have attended particularly those from the small-scale gold mining sector, the gold and mercury dealers and the Local Government Units. It is hoped that these groups will be represented in subsequent activities.

The need to take immediate actions and fast track the strategic planning process is impelled by the fact that while good ideas are traded, new gold rush areas are discovered as the price of gold continues to rise and poverty remains a constant problem for many. These factors consequently bring about to increase environmental harm, emission of mercury from the sector poses a major concern, while more miners and their children are and exposed to occupational and health hazards. As both countries embark on the preparation of their respective plans, appropriate interventions should be initiated as soon as possible in areas that are feasible and are likely to create significant impacts.

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## **Inception Workshop: Strategic Planning for Artisanal and Small-scale Gold Mining in Asia**

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### **Introduction**

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### **Rationale**

Artisanal and small scale gold mining is a complex development issue that presents many intertwining challenges. While it is an important source of subsistence to a considerable number of people and help buoys the national economy, it is also beset with large-scale environmental, health and social problems. It is therefore imperative for national governments, in collaboration with concerned stakeholders to develop and implement programs and strategies that will facilitate the effective reduction of mercury and at the same time improve the quality of life of miners and their families. To hasten the migration of miners to cleaner and more sustainable gold production methods and maximize their benefits, it is necessary to improve understanding of the inner workings of the sector, the current mining practices, the motivations and interests as well as barriers for miners in adopting mercury-free technologies in order to facilitate the introduction of appropriate and effective interventions.

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## Objectives

The workshop was conceived to set the impetus for the development of national artisanal and small-scale gold mining strategic plans for Philippines and Cambodia which will supplement regional efforts to protect health and the environment from mercury in the sector. The plans, which the participating governments will develop in collaboration with various stakeholders, will include, among other things, a review of legal, educational, economic, and regulatory and enforcement framework. The strategic plan will likewise incorporate budget and workplan as well as potential funding sources and partners for future work.

Specifically, the three-day workshop was organized to:

- a. review the overall requirements for the development of the National ASGM Strategic Framework Plan;
- b. review information gathered by countries in the questionnaire and plan next steps;
- c. develop Terms of Reference for the National Steering Committee and add national milestones into the Overall Project Work-plan;
- d. present the current national situations on ASGM;
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- f. enhance regional collaboration and coordination through exchange of experiences and lessons learned.

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## Expected Outcomes

The expected outcomes of the workshop include:

- a. understanding by the participating countries on the expectations of the project;
- b. development of Draft Terms of Reference for national committee and national workplan for consideration at the national level;
- c. providing a venue for the speedy completion of data gathering exercise;
- d. agreement on the mechanism for overall project collaboration;
- e. identification of immediate actions that would have immediate benefits at the national level and would feed into assessment process; and
- f. report preparation by the Philippines which includes a summary of the discussions and compilation of the presentations.



## Participants

For the purpose of identifying and addressing the various issues and concerns facing the ASGM industry, the workshop brought together representatives from various sectors including those from concerned national government agencies, academic and financial institutions, non-government organizations, foreign funding institutions and the large-scale mining group. The complete list of participants in the workshop is in Attachment B of this report.

## Summary of Workshop Proceedings

### 1. Opening Session

Atty. Juan Miguel Cuna, Department of Environment and Natural Resources - Environmental Management Bureau (DENR-EMB) OIC-Director, welcomed the participants to the inception workshop as he expressed his gratitude to the organizers for making the event possible. He said that the workshop is part of the cooperative efforts of the participating governments to the United Nations in addressing the problem of the rising of incidence of occupational exposure to mercury as well as its significant releases to the environment in the artisanal and small-scale gold mining sector. Citing the report of the United Nations in 2006 which found miners from the Philippines to have mercury levels up to fifty times above the World Health Organization limits, Atty. Cuna said that around 300,000 men, women and children in the Philippines are affected by mercury intoxication.

He also stated that the three-day regional workshop shall concentrate at prompting the participating governments to develop multi-stakeholder national strategic plans for artisanal and small-scale gold mining (ASGM). He added that the activity will involve a review of legal, educational, economic, regulatory and enforcement frameworks as well as the budget and workplan, all of which are critical in reducing the exposure to and the releases of mercury. He also said that with the continuing support from the United Nations Environment Programme (UNEP), regional collaboration and coordination are enhanced through the exchange of experiences and lessons learned on a regional level to address the global concern of mercury exposure.

Ms. Brenda Koekkoek, UNEP Mercury Programme Officer also delivered a message on behalf of UNEP. She thanked the government of the Philippines for hosting the workshop and for the warm welcome the foreign guests have received in Manila. She said that artisanal and small-scale gold mining is a complex global development issue which poses many health and environmental policy challenges, on one hand, and much opportunity for income generation on the other. She then commended the Philippines and Cambodia for showing leadership and stepping up to the challenge of developing strategic plans in the sector. She pointed out that the partnership project is of interest globally as the world governments embark upon a negotiation of a legally-binding instrument on mercury this year. She said that the creation of strategic plans will also provide an opportunity for the participating countries to raise awareness of the issue at the national and local level, to gather information, to build capacity to address the issue and to contribute to an overall greener economy.

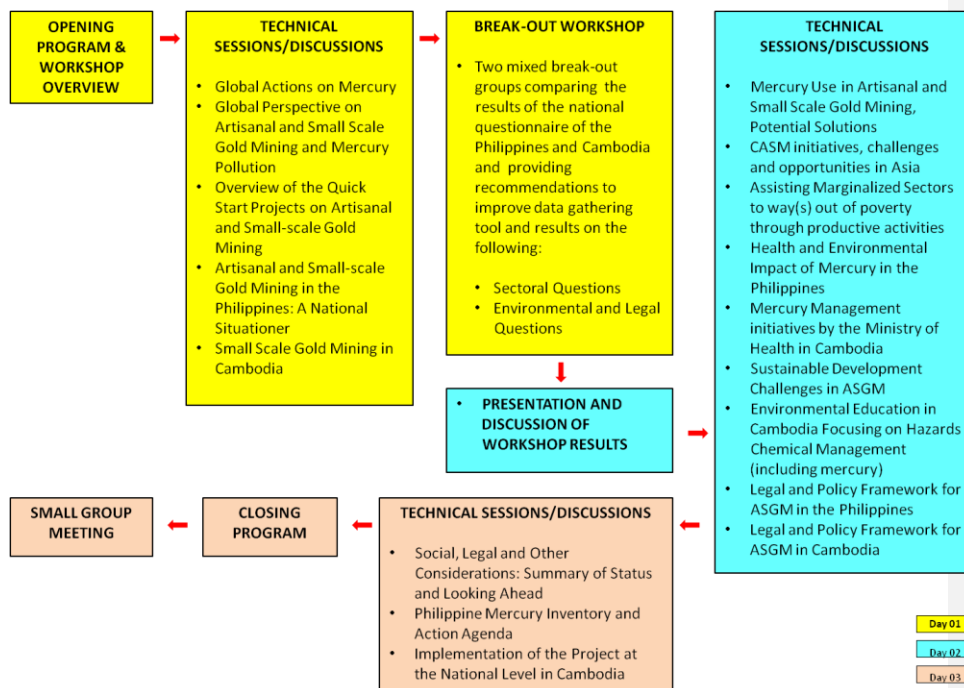
Ms. Koekkoek also stated that while the aim of the partnership is specifically to reduce the use of mercury, she hopes the project will also help the countries build better chemicals management agendas and contribute to a sustainable development agenda both in the national governments and national programs. She encouraged the involvement of various stakeholders in all stages of the plan formulation process to contribute in the development of the comprehensive strategic plan and in its eventual implementation.

She also said she sees it very appropriate that the Quick Start Program of the Strategic Approach to International Chemicals Management (SAICM) of UNEP has provided the funding for the

activity. In expressing her optimism that the inception workshop will be productive and successful, Ms. Koekkoek said she had the opportunity to work with people from both governments over the past years on the national mercury inventories and she trusts that with the active support of everybody, the project will be off to a good start.

## 2. Overview of the Inception Workshop

Mr. Renato Cruz, Chief of the Environmental Quality Division & Project Adviser, Mercury Inventory Toolkit Project of the DENR-EMB, presented the objectives and agenda for the inception workshop. The chronological presentation of the flow of activities has been translated into a workshop process flow which is reflected below:



### 3. Presentations

During the workshop, a total of sixteen (16) presentations were organized to provide the participants with basic information and insights on topics related to mercury and ASGM. Below are brief highlights of the presentations, the open forums that ensued, and results of the discussions:

#### 3.1. Global Actions on Mercury

Ms. Brenda Koekkoek  
Mercury Programme Officer, UNEP

Mercury, which is long known for its toxicity to human health and the environment is widely used and released from a number of sectors globally. It is subject to long-range transport in the environment, crossing and polluting across international borders. The unique waste management issue that it poses is that it can neither be created nor destroyed.

During the 25th UNEP Governing Council meeting in February 2009, the participating countries decided to launch negotiations on an international mercury treaty to deal with world-wide use, emissions and discharges of mercury. The meeting has also facilitated accelerated voluntary action on mercury with the Global Mercury Partnership as one of the key delivery vehicles.

##### The mercury treaty

Negotiations by an intergovernmental negotiations committee (INC) for the legally-binding treaty will begin at INC 1 from 7-12 June in Stockholm, Sweden. There are 5 INC meetings anticipated from its commencement to its conclusion in 2013. Negotiations will include both binding and voluntary measures.

The future mercury treaty will include provisions to:

1. Reduce the supply of mercury and enhance the capacity for storage.
2. Reduce the demand for mercury in products and processes.
3. Reduce international trade in mercury.
4. Reduce atmospheric emissions of mercury.
5. Address mercury-containing waste and remediation of contaminated sites.
6. Increase knowledge through awareness-raising and scientific information exchange.
7. Specify arrangement for capacity-building and technical and financial assistance.

Voluntary actions will likewise proceed in areas where mercury is used through the Global Mercury Partnership. The overall goal of the partnership is to protect human health and the global environment from the release of mercury and its compounds by minimizing and, where feasible, ultimately eliminating global, anthropogenic mercury releases to air, water and land.

In the interim, UNEP will continue and enhance existing work in these areas:

- Storage
- Reducing supply

- Conducting awareness-raising and pilot projects
- Reducing Hg in products
- Providing information on BAT and BEP
- Enhancing development of national inventories
- Raising public awareness
- Providing information on sound management

The partnership will work on areas where mercury is used:

1. Mercury emissions from coal combustion
2. Artisanal and small scale gold mining
3. Mercury in products
4. Mercury supply and storage
5. Mercury containing waste
6. Chlor alkali production
7. Fate transport and air research

#### **Global Mercury Partnership (GMP)**

GMP was initiated in 2005 by the UNEP Governing Council to address global concerns about mercury pollution. The partnership was strengthened through a strong Governing Council Mandate in 2007, while the Overarching Framework was launched in 2008. The initiative currently involves 46 official partners, with the UNEP designated as the Secretariat.

#### **ASGM partnership**

ASGM is a key partnership area, jointly led by the United Nations International Development Organization (UNIDO) and the Natural Resources Defense Council (NRDC). Its target is to promote a 50 percent reduction in mercury demand in ASGM by the year 2017 by strategically complementing existing programmes on ASGM in developing countries. The partnership focuses on four priorities:

1. Support government efforts in setting national objectives/reduction targets for ASGM, including facilitating the development of 'Strategic Country Plans'.
2. Eliminate the practice of whole-ore mercury amalgamation and achieve additional reductions in mercury use and emissions throughout the sector.
3. Promote awareness and adoption of clean ASGM practices and technologies.
4. Explore innovative market-based approaches to address the issue.

ASGM is widespread and recognized as complicated global development issue and the mercury treaty is not a quick fix to the global ASGM issue, but it should help in addressing some aspects. The ASGM Strategic Planning for the Philippines and Cambodia will help bring important information for both the partnership and the treaty process.

### **3.2. Global Perspective on Artisanal and Small Scale Gold Mining and Mercury Pollution**

Ms. Susan Egan-Keane  
Natural Resources Defense Council, USA

#### **The global problem of mercury pollution**

Mercury pollution is a global problem that warrants international attention. Mercury cycling threatens global fish supply which in turn poses risks for pregnant women, children and sub-populations dependent on fish and marine mammals. Artisanal and small-Scale gold miners especially suffer from acute health impacts due to mercury exposure. In 2005, the World Health Organization advised that mercury may not have a safe threshold of exposure.

#### **ASGM and Mercury**

Artisanal and small-scale gold mining provides a source of livelihood to 10-20 million people around the world. The sector also represents about one-third of the total worldwide mercury consumption. Among the reasons advanced why mercury is used in gold processing is that it is cheap, easily accessible, quick and easy to use. Of the estimated 1350 tons of mercury released from the sector per year, about 40 percent end up in the atmosphere while 60 percent find their way to aquatic systems.

#### **High-risk practices**

The current practice of extracting the gold from the amalgam presents a high risk among miners. The open-air burning of gold-mercury amalgam causes the direct emission of mercury to the atmosphere where human exposure is extremely high. Contaminated amalgam tailings are left on-site where they can leach mercury into the soil and water.

#### **Measures to reduce emission**

There are some innovations to help reduce mercury emission from the sector. Among them are the introduction of the use of retort to trap the mercury during the heating of the amalgam and the re-activation of mercury to restore its capability in capturing gold.

#### **International Response to Mercury Use in ASGM**

At the international level, there are some efforts to help address the issue of global mercury pollution and one of them is the Global Mercury Project which was initiated in August 2002 by the Global Environmental Fund/United Nations Development Programme/UNIDO. The goal of the project is to demonstrate and promote adoption of best practices to limit the mercury contamination from ASGM. Another initiative is the UNEP Mercury Programme Partnerships which aims to reduce mercury use and emissions in key sectors including the ASGM sector. Another response is the imposition of trade restrictions on mercury. The European Union and the United States which account roughly one-third of the global mercury supply are set to impose ban on mercury exports beginning 2011 and 2013 respectively.

#### **Mercury treaty**

The Governing Council of UNEP has commenced negotiations on an international treaty to control mercury pollution which is expected to be concluded by 2013. In this regard, there is a mandate to the INC to consider supply, demand, and trade measures.

#### **Implications for ASGM**

The imposition of mercury trade restrictions will result in the increase in price of mercury while ASGM “industrial process” will be subjected to possible control measures. There is also a probability of setting up a financial mechanism to help developing countries implement measures including those in the ASGM sector. The decision to start negotiating for mercury treaty also specifically calls for governments to provide assistance for pilot projects on ASGM while treaty negotiations are underway.

#### **ASGM realities**

The ASGM sector is extremely decentralized and regulatory approaches have limited effectiveness, especially due to widespread illegal mercury markets and mining activities. The sector provides an important mode of employment where alternatives are not easily found, and social or cultural mores can influence business practices.

#### **Reduction of mercury in ASGM**

To reduce mercury use in ASGM, there is a need to restrict supply and availability of mercury in the industry. It is also important to organize and formalize the miners and conduct outreach activities with information and technologies and provide them with the means to increase productivity and profitability while decreasing mercury use and releases. The development of successful models of transition to low/non-mercury techniques as well as the provision of financial and technical support for scaling up can also be helpful.

To realize these goals, the immediate steps will be to reduce availability and increase price of mercury as soon as possible, provide information and training on alternative methods for miners, expand awareness-raising and pilot projects in key countries. These projects must be carried out soon in order for results to inform negotiations. The UNEP Global Mercury Partnership is one vehicle for carrying out projects.

#### **ASGM Partnership**

As mentioned earlier, the overall goal of the ASGM Partnership is the reduction by 50 percent of mercury use and emissions by 2017. The Partnership has identified four priority areas for pilot/demonstration projects in 2008 business plan. These are the:

1. Provision of support to government efforts in setting national objectives/ reduction targets for mercury use in ASGM;
2. Improvement of practices;
3. Promotion of awareness and adoption of cleaner ASGM practices and technologies; and
4. Exploring innovative market-based approaches

A more substantial financial support is however critically needed to further work in each of these priority areas.

Immediate partnership priorities include the documentation of existing efforts on legalization and formalization, establishment of global knowledge base on ASGM, development of technical manual of existing technologies and practices, and feedbacking on mercury requirements for

Alliance for Responsible Mining Foundation (ARM)-Fairtrade Labelling Organizations International (FLO) gold standard.



### **3.3. Overview of the Quick Start Projects on Artisanal and Small-scale Gold Mining**

Ms. Brenda Koekkoek  
Mercury Programme Officer, UNEP

Strategic Planning is one of the priority actions of the ASGM partnership area. This is one of two projects initiated by the partnership through the Strategic Approach to International Chemicals Management (SAICM) Quick Start Programme:

1. South-East Asia (Cambodia & the Philippines)
2. South America (Peru and Bolivia)

#### **SAICM Quick Start Programme**

The initiative supports initial enabling, capacity building and implementation activities in developing countries for sound chemicals management, in particular:

- a) National chemical profiles and the identification of capacity needs;
- b) Development and strengthening of national chemicals management institutions, plans, programmes and activities, building upon international chemicals-related agreements and initiatives;
- c) Undertaking analysis, interagency coordination, and public participation activities and informing development assistance cooperation priorities.

The Quick Start Program (QSP) seeks to assist countries to formalize/regulate the ASGM sector and provide insight as the mercury treaty is developed. It will work with governments to address financial, policy and regulatory options which can improve the ability of mining communities to achieve mercury reductions.

The QSP's overall project objectives include securing commitment of national governments in the Philippines and Cambodia in addressing ASGM, developing multi-stakeholder strategic plans for mercury reductions in ASGM, building upon on-going activities and enhancing regional collaboration and coordination in the sector.

Its main output includes drafting of Guidance Material and the development of national strategic plans for Cambodia and the Philippines as well as multi-stakeholder engagement and coordination in the plan formulation process.

Draft of the Guidance Material has been developed by UNEP to support national governments in the development of the national strategic plan. It aims to assist in uniting stakeholders in a common mission to improve the quality of life in ASGM communities. The Guidance Material outlines a 6-step process, proposes a draft outline for the strategic plan. This will be revised based on experiences with the project.

The Strategic Plans are envisioned to contain the following:

1. Executive Summary
2. Introduction and Background
3. National Overview

4. Priority Goal and Objectives
5. Implementation Strategy
6. Evaluation Mechanism
7. Annexes
  - Terms of reference of the working group
  - Detailed baseline analysis
  - Overall proposed detailed budget

Multi-stakeholder engagement could be improved through the workshop and its outcomes, the establishment of national coordinating mechanisms and other processes which may come along as the project proceeds.

Below are the proposed timelines for the Strategic Planning project:

Preparatory Work	–	questionnaire and ToR for working group
19-21 January 2010	–	Inception Workshop
31 January 2010	–	National Steering Groups formed, national workplan is finalized, completed data gathering exercise.
31 March 2010	–	Initial draft submitted to UNEP for comment.
31 July 2010	–	Final Draft prepared.
30 October 2010	–	Deadline for endorsement at the national level
1-3 September 2010	–	Results Workshop in Cambodia (to be confirmed)

### 3.4. Artisanal and Small-scale Gold Mining in the Philippines: A National Situationer

Atty. Jonas Leones  
Asst. Director, DENR-EMB  
Philippines

#### Philippine gold deposits

The Philippines is endowed with rich mineral resources. About 30 percent of its territory has been identified to have high potential of mineral deposits. Gold is one of the most important. Based on density of deposits per one-square-kilometer land area, the country is ranked third in the world. In 2002, the Mines and Geosciences Bureau (MGB) of the Department of Environment and Natural Resources (DENR) estimated the country's gold reserves at 967,180,197 metric tons. Gold deposits have been reported in about 40 provinces. ASGM activities is said to occur in more than 30 provinces. Small-scale gold mining is concentrated geographically although some of the provinces have more than one mining sites.

#### Annual gold production

Since 2001, the Philippines' average annual gold production was reported at 36,373 kilos, putting the country consistently in the list of top twenty gold producing countries in the world. More than 28 tonnes or about 80 percent of the country's annual gold supply comes from the artisanal and small-scale gold mining sector. The volume could be higher but since most of small-scale gold mining is operated without license, some of their production is unreported or unofficially accounted.

Year	Total	Small-Scale	Large-Scale
1997	31,199	14,062	17,137
1998	34,038	19,859	14,179
1999	31,050	17,045	14,005
2000	36,540	21,193	15,347
2001	33,841	22,656	11,185
2002	35,848	27,993	7,855
2003	37,843	31,473	6,370
2004	35,464	29,473	5,991
2005	37,488	32,117	5,371
2006	36,141	29,361	6,780
2007	38,792	31,193	7,599
2008	35,568	28,198	7,370

Source: U.S. Geological Survey (United States Geological Survey and Department of Energy).

#### ASGM profile

Artisanal gold mining operations are often family enterprises, where women and children are actively involved. There is difficulty in arriving at the total number of artisanal and small-scale gold miners in the Philippines because most of them operate informally and often outside the reach of government rules and regulations. Studies suggest that there are more than 300,000 small-scale gold miners in the country (Appel, 2007), which includes close to 18,000 women and children. With the recent increase in gold prices, discovery of new gold rush areas and economic recession, the number may continue to increase in the coming years. The industry also supports directly and indirectly the livelihood of about one million people.

Some small-scale miners operate with permits and most of these are located in provinces with functional Provincial Mining and Regulatory Boards (PMRB). Data obtained from the MGB shows that in 2007, there were about 33 permits issued to small-scale gold miners covering more than 400 hectares gold mining areas.

#### Gold mining and production methods

Artisanal and small-scale gold mining in the Philippines takes several forms: surface, underground and underwater. Surface mining is done along river beds and streams while

underground mining requires digging up of tunnels to extract gold-bearing ores. For instance, in the Camarines Norte area, gold-bearing alluvial deposits are extracted through compressor mining where the miners descend in mucky waters using a plastic hose attached to a compressor and tucked inside their mouth.

Gold-bearing ores extracted from the mines are crushed into different particle sizes either manually using sledgehammers or mechanically with ball mills. Crushed ores are then fed into a rod mill or ball mill for grinding until they are reduced into fine particles. Some areas practice whole ore amalgamation by mixing mercury during grinding. Other miners apply mercury to capture the gold recovered from a sluice box.

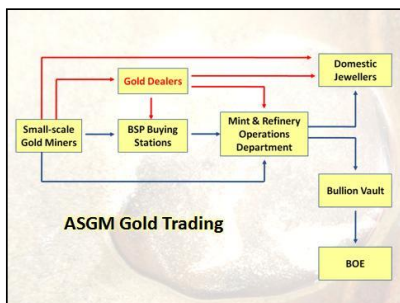
Another method frequently employed by miners is the use of a sluice box. This method uses gravitation by letting the ore pass through a wooden or concrete sluice which is covered with materials, such as corduroy cloth or carpet, which captures the gold grains when the ore and water mixture passes the sluice. The cloth is washed in a basin to recover the gold and other grain particles collected, which afterwards are panned to separate the gold from other particles.

Under the process called whole ore amalgamation, the mercury-ore mix are removed from the drum and placed on a large basin, then transferred to a washing pan, where water is added to retrieve the mercury that is loaded with gold. Mercury retrieved is squeezed using a piece of cloth to separate it from the gold. The remaining amalgam is blowtorched in a circular clay pot. Borax is intermittently applied to remove the impurities. If the desired gold quality is not attained, gold is soaked with nitric acid.

Another method employed by miners is the cyanidation process where gold is extracted from ores by means of the solvent action of an alkaline cyanide solution. The gold in the ore is dissolved by leaching or by agitating the ore in cyanide solution. In both processes, a gold-rich pregnant solution is derived. The gold in solution is recovered by precipitation using several precipitating agents, which include zinc dust. Cyanide is also used in carbon-in-pulp or carbon-in-leach systems where activated carbon is included in the feed to absorb the gold solution and the gold-laden activated carbon is further processed by cyanidation and the resultant solution is then subject to electrowinning to finally recover the gold. In some areas, sand tailings are brought to cyanide plants for further gold recovery.

### ASGM gold trading

Pursuant to Republic Act 7076, the Bangko Sentral ng Pilipinas (BSP) has established gold buying stations to purchase gold in Philippine pesos at prices competitive with those prevailing in the



world. Gold sold to BSP must however conform to certain conditions set by the bank as to physical form, maximum dimension, weight and minimum assay. BSP's gold buying stations include the Mint and Refinery Operations Department (MROD) in Quezon City and its offices in the cities of Baguio, Naga, Davao and Zamboanga.

Gold produced by small-scale gold miners which meet the criteria are sold directly at the MROD or at BSP's

buying stations which in turn bring them to MROD for refinement and conversion into London gold delivery bars. Some of the gold may also be manufactured into semi-finished material in the form of grains and sheets for re-sale to local jewelers and industrial users. Due to the difficulty of small scale gold miners to meet the standards set by the bank, and their distance to the gold buying centers, they sell their gold to independent gold dealers often at a rate lower than the prevailing market price. In Benguet for instance, it is said that about 40 percent of ASGM production is lost to the black market.

#### **Mercury use and emission in ASGM**

The widespread use and emission of mercury in artisanal and small-scale gold mining and the consequent danger it poses to health and the environment has been a cause of concern by many sectors. Attempts were made to estimate annual mercury release from the industry.

In 2008, a mercury inventory assessment undertaken by the Philippine government using the UNEP toolkit reveals that about 70 tons or more than 30 percent of the country's annual mercury emission comes from small-scale mining.

In 2007, an investigation made by the Geological Survey of Denmark and Greenland (GEUS) and the Maximo T. Kalaw Institute for Sustainable Development approximates five (5) tons of annual mercury emission from small-scale mining communities in Zamboanga del Norte and Camarines Norte.

According to the assessment made by the Department of Health that was submitted to the UNEP in 2001, small-scale gold mining in Northern Mindanao alone emits 140 tons of mercury annually.

Past studies also show that in the early 90s, the small-scale gold mining sector accounts for 25 tons of mercury release annually while another study reveals that between 1986 to 1988, about 140 tons of mercury was released into the environment from 53 mining communities.

#### **ASGM Legal and Policy Framework**

The principal laws governing small-scale mining in the Philippines are Presidential Decree 1899 which established small-scale mining as a new dimension in mineral development, and Republic Act 7076 which aims to promote, develop, protect and rationalize viable small-scale mining activities, generate more employment opportunities and provide an equitable sharing of the nation's wealth and natural resources.

Presidential Decree 1899, the first known law to govern small-scale mining in the Philippines was issued in 1984, prompted by the government's recognition of the increasing economic impact of the small-scale mining sector. The decree was intended to develop small mineral deposits, generate income for the poor and alleviate the living conditions in the rural area.

To further promote, develop, protect and rationalize small-scale mining activities, the Philippine Congress passed in 1991 Republic Act 7076. The law requires, among others, the establishment and implementation of a People's Small-Scale Mining Program to achieve an orderly, systematic and rational scheme for the small-scale development and utilization of mineral resources and

address the social, economic, technical, and environmental concerns connected with small-scale mining activities.

While small-scale mining activities continue to be governed by Presidential Decree 1899 and Republic Act 7076, Republic Act 7942 carries provisions which have direct and indirect effect on the operations of small-scale miners. For instance, it exempts from real property tax and other taxes and assessments pollution control devices established by mining contractors while it penalizes firms causing environmental damage through pollution. The Mining Act of 1995 likewise provides additional requirements to small-scale miners before the issuance of permit.

Executive Order No. 270, as amended by Executive Order No. 270-A, likewise seeks to promote small-scale mining as a formal sector of the minerals industry.

### **Regulatory framework**

The DENR has also taken regulatory measures with the issuance of Administrative Order 92-34 which provides for the implementing rules and regulations of Republic Act 7076. In 1992, DOH issued Circular 22-C which provides for guidelines and measures for the safe usage of mercury by small-scale gold miners while in 1997, DENR released Administrative Order 97-30 providing for safety rules and regulations for small-scale miners.

In July 2007, DENR issued Department Memorandum Circular 2007-07 providing for clarificatory guidelines in the implementation of the pertinent provisions of the small-scale mining laws, specifically PD 1899, RA 7076 and RA 7942. Designed to harmonize the implementation of the aforementioned laws, the guidelines provide, among others, that “small-scale mining operations in areas not declared as People’s Small-scale Mining Area (PSSMA) shall be covered by Small-Scale Mining Permits (SSMPs) issued under PD No.1899 while small-scale mining operations in PSSMAs declared under RA No. 7076 shall be covered by Small-Scale Mining Contracts (SSMCs) pursuant to the pertinent provisions thereof. The memorandum circular also reiterated the prohibition on the use of explosives and/or blasting accessories.

Other laws and regulations that have direct and indirect relevance to small-scale mining and the use and emission of toxic substances are the following:

1. Republic Act 7160, also known as the Local Government Code of 1991;
2. Republic Act 7586 otherwise known as National Integrated Protected Areas System (NIPAS) Act of 1992;
3. Republic Act 9147, also known as the Wildlife Resources Conservation and Protection Act;
4. Republic Act 8371 otherwise known as the Indigenous Peoples Rights Act (IPRA) of 1997;
5. Republic Act 6969, also known as the Toxic Substances, Hazardous and Nuclear Wastes Control Act of 1990;
6. Republic Act 9003, also known as the Ecological Solid Waste Management Act of 2000 (Republic Act 9003);
7. Republic Act 8749 or the Clean Air Act of 1998;
8. Republic Act 9275 or the Clean Water Act of 2004; and
9. Presidential Decree No. 984 or the Pollution Control Law of 1976.

### Mercury trade in ASGM

In spite of the prohibition against mercury-use in the ASGM sector, usage of mercury still occurs. Prices of mercury vary: For instance, in Baguio City where miners from Benguet, obtain mercury, the substance is sold at Php4,000 – Php6,000 per kilo (on average around US\$111). In Camarines Norte, price of mercury ranges from 2,400 – 2,800 a kilo (ave. US\$57). In certain mining areas, mercury is available in local sari-sari stores at P6.00 per gram (US\$0.13). In Baguio City, miners buy mercury in grams whereas miners in Paracale and Jose Panganiban, Camarines Norte purchase mercury in kilo, often once or twice a month.

### ASGM issues and concerns

#### a) Environmental impacts

**1. Deforestation and landscape destruction.** Considering that small-scale gold mining usually occurs in forestlands, where miners and their families clear forests for habitation and other economic activities including the cutting of timbers to support their mine tunnels, the activity has aggravated the denudation of our forest and the distortion of scenic landscapes.



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**2. Contamination of water bodies due to cyanide and mercury pollution.** The excessive use and emission of toxic substances like mercury and cyanide during gold processing has also resulted in the consequent contamination of several water bodies thereby undermining their beneficial use. Overflowing and often leaking mine tailings contaminated with mercury and cyanide are discharged directly in rivers and creeks and in due time end in seas and oceans.

Results of studies on the effects of mercury pollution in selected ASGM sites may be summed up in this wise:

- drinking waters and river systems have exceeded recommended water quality criteria;
- Marine species such as mollusks and fishes have mercury levels that are more than the allowable limit;
- People that were examined mostly children, miners and their families exhibited symptoms of mercury intoxication.

**3. Soil erosion and siltation.** Deforestation and landscape destruction has resulted in soil erosion and siltation which in turn resulted in instant flooding, with consequent damage to crops, properties and even lives. A village chief in Jose Panganiban, Camarines Norte once described their situation that in his barangay or village, waste rocks from the mining site find their way to the rivers and streams causing these water bodies to immediately overflow during rainy seasons resulting in flash floods. He said that they now feel the disastrous effects of mining. In 2006, Runruno, Quezon, Nueva Vizcaya also experienced two flash floods which killed seven people and nearly wiped out one whole village. While the incident may not be attributed solely to small-scale gold mining which has been taking place in the village since the 1960s, the volume of waste rocks deposited in rivers and creeks has aggravated the peoples' misfortune.

**4. Biodiversity loss.** Contamination of water bodies also resulted in the disappearance of various life forms especially aquatic resources. Local stories are prevalent about how their rivers and streams used to be teeming with abundant fish and other life forms. Now, all that is left are stories and trails of destruction.

**5. Loss of soil productivity.** In most mining areas, miners turn to farming to augment their income. However, soil productivity has been reduced by erosion, deforestation and the impairment of water sources.



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#### b) Social and health problems

**1. Unregulated migration in mining areas especially in “gold rush areas”.** Most gold rush miners in the Philippines are migrants who do not have legitimate claim on the areas where they operate.

**2. Land tenure and resource use conflicts.** The tendency of miners to swarm around a gold deposit area often results in conflicts in mining rights and resource uses, which often leads to violent confrontations between and among them as well as with the local residents.

**3. Limited access to health and basic services.** Most mining communities also have either no or little access to clean water or basic health care services. Break out of diseases like malaria and diarrhea have been documented in several mining areas. Other diseases frequently experienced by miners include tuberculosis, skin diseases, pneumonia, cough and upper respiratory tract infection. There are also reported cases of venereal diseases like gonorrhea.



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**4. Exposure of miners to occupational health and safety hazards.** Basic safety equipment like helmet, safety boots, gloves and dust masks appears to be a low priority among miners, hence their exposure to health risks ranging from the effects of poor ventilation to exposure to dust and toxic chemicals like mercury, cyanide and nitric acids. Occupational hazards ranging from electrocution, gas poisoning, and accidents from explosives, eroding soils and falling rocks, often resulting to injury or sickness and even death among the miners have also been reported from the mining areas.

**5. Exploitation of workers especially minors.** Lack of capital has forced mine workers to deal with local financiers under terms dictated by the latter that has often put the workers on the losing end of the bargain. After deducting the expenses incurred by financiers most of which were advances made by the workers for their family’s subsistence while the mines are not yet productive, profits are divided with the financier getting the lion’s share.

**6. Absence of social security benefits for miner-labourers.** Notwithstanding the risks encountered by the mine labourers, and the measly income they receive from exposing their life and limbs to the dangers of the trade, they do not have any health or life insurance or any social



security benefits. They only cling on to the verbal assurance of financiers that in case something untoward happens to them, the latter will be financially responsible.

**7. Cases of mercury poisoning and high levels of mercury among miners and their families.**

As mentioned earlier, investigations on the effects of mercury pollution in certain ASGM sites have shown high mercury levels among miners and their families attributed mostly to their simultaneous exposure to inorganic and methyl mercury. It may likewise be recalled that in 2006, the United Nations reported that miners in the Philippines are found to have mercury levels up to 50 times above World Health Organization limits.

**8. Proliferation of societal vices in mining areas.** Societal vices like gambling, prostitution and alcoholism, among others, were likewise been observed to be prevalent in some mining sites especially in so called gold rush areas.

**c) Legal, enforcement and institutional problems**

**1. Weak and non-operational mining regulatory boards.** Almost all city and provincial mining regulatory boards in the country have been organized; however, it appears that foremost in their agenda pertains to quarry operations save for the case of PMRB in Benguet, which may be cited for its support for small-scale gold mining.

**2. Costly and difficult permitting and licensing process.** The demanding procedures to gain formal operation have likewise dissuaded small-scale gold miners to apply for permits.

**3. Ineffectual enforcement of small-scale mining and other related laws.** The seeming culture of tolerance and hands-off policy by both the national and local governments have likewise rendered ineffectual the enforcement of small-scale mining laws.

**4. Small-scale mining companies undertaking large-scale operations.** Under our small-scale mining laws, small-scale mining permittees are allowed to mine up to 20 hectares per permit and extract up to 50,000 dry metric tons of metallic and non-metallic minerals annually. There have been reports, however, that some small-scale mining companies exceed the extraction limits.

**5. Insignificant role of LGUs.** While the enforcement of small-scale mining laws have been devolved to the provincial LGUs by virtue of the Local Government Code, we have yet to see the active participation of the provinces, let alone smooth coordination in addressing small-scale mining concerns.

**6. Uncontrolled ASGM activities in protected and watershed reservation areas.** Small-scale mining activities are also reported within ancestral domains of Indigenous Peoples and in established protected areas as well as watershed reservation areas such as in Mount Guiting-Guiting Natural Park in Sibuyan Island, Romblon and the Bugkalots Ancestral Domain in Nueva Vizcaya, to name a few.

**ASGM stakeholders**

- a. Artisanal and small-scale gold miners
- b. ASGM communities and adjacent villages
- c. Government
  - DENR-MGB-EMB
  - Local Government Units
  - Other government agencies (e.g. DOH, NCIP, BSP, DOLE, DTI, CDA, DOST)
- d. Multi-sectoral Boards (e.g. PMRB, PAMB)
- e. Church
- f. NGOs and other caused-oriented groups
- g. Gold and mercury traders (including jewelers)
- h. Large-scale mining companies
- i. Research and academic institutions

**ASGM support interventions: past and present**

In recent years, the sad state of the ASGM sector has gradually gained recognition and funding support has been provided in an attempt to create a facilitating environment and improve the plight of miners. In 2008, the Environmental Management Bureau has formulated an Associated Action Plan for Mercury in the Philippines. One of the action items embodied in the said document is the implementation of the Quick Start Programme for Small Scale and Artisanal Mining in partnership with UNEP.

The Philippine government for its part has caused the formulation of environmental regulations to restrict mercury use in the country. The Department of Health and the UP-National Poisons Management and Control Center has been undertaking health monitoring of mercury contamination in ASGM communities, orientation of rural health units (RHUs) and barangay health workers on the toxic effects of mercury and information, education and communication campaigns on the effects of mercury.

In 2006, Maximo T. Kalaw Institute for Sustainable Development received from World Bank and GEUS funding assistance for the training of small-scale gold miners and their families in safe handling of mercury during gold extraction focusing, among other things, on the application of borax technique and mercury recycling using a device known as retort.

Various conferences, meetings and consultations have likewise been carried out purposely to provide a venue for discussion of ASGM concerns. Several studies have likewise been conducted to investigate the extent of mercury use and the degree of its impact among affected communities. Researches were also made exploring mercury free alternatives for gold processing.

Last year, world governments have agreed to start negotiating a treaty to control global mercury pollution and one of the items seriously considered in the negotiation for mercury treaties is the inclusion of a provision on ASGM which is expected to push various governments to develop a national framework that will include measures to control mercury use and emissions in the industry.

### 3.5. Small Scale Gold Mining in Cambodia

Mr. Ben Bunnarin  
Chief of Geo - Research Office  
Department of Geology, Cambodia

The discovery of new gold deposits in the 80s, the low income of farmers and the introduction of easier and cheaper gold treatment techniques have triggered a gold rush in Cambodia. A total of 25 gold deposits in placer and quartz vein have been discovered in the country.

#### Gold processing methods

In mid-80s, amalgamation was prevalent among miners from the five new-found gold deposits. In the early 90s, cyanidation was introduced and used in four gold deposits and was later expanded in seven mining sites by late 2000, although amalgamation is still practiced in some areas. The use of gold pan and sluice box was later introduced.

Gold mining and processing techniques involve hard grinding, sluicing and panning with mercury, treatment of mineral concentrate with acid and cyanide leaching.

#### ASGM impacts

While gold mining in Cambodia has contributed to the alleviation of farmers from poverty, it has spawned several social, economic and environmental issues. Diseases were attributed to the contamination of drinking water while the improper mining and processing techniques pose risk to public health. The spread of malaria disease has likewise been documented in mining areas. While the small-scale mining sector contributes to the wastage of the country's resources, no benefit is derived by the government from the activity. The sector also contributes in the contamination of soil and water, depletion of aquatic biodiversity and erosion of riverbanks. The use of chemicals in small-scale mining also poses risk to humans.

In 2001, the Cambodian government enacted a Law on Management and Exploitation of Mineral Resources which comprises 10 Chapters and 42 Articles. Relevant provision on small-scale mining provides that "artisanal mining license shall be issued to explore or exploit mineral resources found in loose and unconsolidated soil, sand, gravel and stone within a demarcated area of land no larger than one hectare and a maximum depth of five meters."

In spite of this, however, artisanal and small-scale mining remains unregulated causing serious economic, social and environmental impacts. The poor implementation of said law may be attributed to the fact that most miners are located in remote areas, lack of training on artisanal and small-scale mining and inadequate financial support.

To address the issues associated with small-scale gold mining in Cambodia, the following measures are recommended:

- improve awareness of miners and introduce proper gold mining and treatment techniques;

- set up necessary regulation purposely to efficiently manage gold mining activities;
- rehabilitate affected resources; and
- conduct intense studies to forecast future impacts.

### **3.6. Mercury Use in Artisanal and Small Scale Gold Mining, Potential Solutions**

Dr. Kevin Telmer  
Director, Artisanal Gold Council

#### **The gold industry**

The gold industry is about 6000 years old. Lots of the gold traded is not newly produced. When gold is traded in the bank for example, there is no presumption on the part of the bank that the gold is produced by mine this week, last week or this year. It is very useful for one to go to places where there are a lot of gold traders to be reminded of this perspective, and to determine the players or stakeholders in the global gold industry. Two of the big players in the gold market at present are the United Arab Emirates and the World Gold Council (WGC). It is not known whether the Bangko Sentral or large scale mining companies in the Philippines have a relationship with the WGC. The council is the premier agency in the planet for the promotion of gold sales and gold use. The council has been trying to improve recognition on gold mining, in particular, the small scale gold miners.

#### **The role of the ASGM industry**

It is very important to point out that in the Philippines, small-scale gold miners contribute substantially to the national reserves. The same is true in many other countries. In Guiana for example, about 25 percent of the country's population are gold miners. So their contribution to the Gross Domestic Products (GDP), gold reserves and financial stability is large.

It is then important to keep in mind the role small-scale mining plays in society in general and try to recast small-scale mining into a different weight, dispel some of the myths associated with the sector and discuss what could be done to accelerate its transition into a more reputable industry. The idea is to make a viable and economically sustainable activity that fits into formal societies and economies. There are many barriers in doing this. But there may be some interesting new innovations. Small-scale miners for instance use cell phones and the internet to get a better price of their gold. This presents an opportunity for us to use the communication channel in transmitting information for better practices to the communities.

#### **Gold and poverty relief**

One of the concerns that may be raised is the source of funds to execute some of the good ideas that have been discussed. While there may be some donor agencies like the UNEP or UNIDO, their interest don't last forever. Part of the interest is then on how to get off of the donor dependent model and use the market system to provide the funds to improve artisanal and small-scale gold mining.

The gold and poverty relief is an excellent mechanism for transferring wealth from rich to poor countries. Small producers often get 70% or more of international price in remote areas. Gold mining is then a very good development opportunity that needs to be brought into the formal economy to maximize the benefits. To make this happen, we have to deal with mercury use in the extraction of gold as the world is becoming increasingly aware that mercury is a global toxic as well as a global pollutant.

Gold mining, both large scale and small scale, has a large contribution to the global mercury problem. There is an estimate that about a million tons of mercury have been used in the extraction of gold over the past 5000 years. And the human health problem that mercury has been creating is large scale.

#### **Myths from the gold rush in Serra Pelada, Brazil**

In 1971, President Nixon separated the American dollars from the gold standards when he ordered that American dollar is no longer founded on the value of gold and vice versa. At that time, gold was worth 35 dollars an ounce. From 1975 to 1979, the price of gold went up from 35 dollars to 800 dollars an ounce. When the price reached 800 dollars an ounce in 1979, a lot of poor people in Brazil, mostly sugar cane workers have realized that this was an excellent opportunity to increase their livelihood and they migrated in Serra Pelada and extracted large amount of gold using mercury. And stories have often been told about the lawless, uncontrolled violent situation in the area.

There is a lot of organization happening in Serra Pelada and in almost every small-scale gold mining camp there is a very sophisticated socio-economic system network that provides many things including security, health care and education. The socio-economic system is not always perfect and is not formalized but most of the time it is a functioning one. But there was a lot of misperception told over and over by the media that there are savages in the jungles hacking each other. This however was not the case in numerous mining camp sites visited.

#### **Gold production and trading**

ASGM currently produces about 12 percent of the global gold production which is larger than any single large mining company in the world. The risk of operational and reputational for large scale miners due to small-scale mining is growing because of invasion and competition over resources and also due to the recognition that the large scale mining resource is decreasing. As gold is getting dirtier, environmental groups have begun to institute campaigns that are against gold mining, one of which is the “don’t tarnish the Oscars with dirty gold” campaign.

It is also important to recognize how much of the so-called above-ground gold exist. Over the last 6000 years, human society has collected gold and there is about 160 thousand tons of gold in circulation and the annual production of gold is only about 2,500 tons. Unlike a commodity which is consumed, gold can be traded and re-traded and recycled over and over again.

#### **Perspectives on ASGM situation**

There have been attempts to move to a mercury-free system but there is no silver bullet or single solution to the problem although there are lots of moving pieces that can be individually tackled.

#### **Current estimate and distribution**

The current estimate on mercury consumption from both the small-scale and large-scale gold mining is from 400 to 1000 tons per year. At present, probably 76 countries have good information on mercury use. Together with UNEP, the Artisanal Gold Council has started building an on-line database that is publicly available through the internet where one can map the amount of mercury emitted from small-scale mining per country per year as well as the amount of gold exported. The purpose of the database is to help the world prioritize where

actions need to happen and to inform the public and the stakeholders about the scale and location of the problems and help provide solutions.

### Scale and economy of ASGM

About 330 tons of gold from 70 countries is produced from the small-scale gold mining per year. At the price of 900 dollars per ounce, this is about 10 billion USD per year. Using conservative estimates where there are 10 million miners, this is equivalent to USD 1000 per miner per year. In comparison, ASGM supports roughly two times the population of Canada at about 40 times lower in income. ASGM is therefore a very important global industry for a lot of people.

### ASGM vs. LSGM in consumption/emission intensity

Small-scale gold mining is much more energy efficient as it releases less joules and greenhouse gasses per unit of gold produced. It also produces less waste rock and less tailings per unit of gold produced. However, it releases five times more mercury in total and 40 times more mercury than large scale mining per unit of gold produced. Those who use cyanide utilize about twice as much than that of large scale mining per unit of gold produced. Cyanide is currently the most dominant technology used by large scale mining to extract gold in the world. There are indeed numerical differences but the big difference lies in the fact that about 99 percent of small scale miners do not practice waste management. And this has to change.

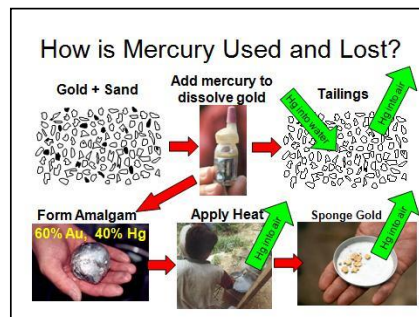
### Remaining ASGM gold resources

The United States Geological Survey (USGS) estimates that there is about 18 more years to extract about 50,000 tonnes of gold remaining for large scale mining. There is no equivalent estimate in ASGM resource although small gold deposits that LSGM may not look up could be an attractive target for small-scale miners. So that in terms of the amount of gold available to be produced in the future, if ASGM is included, the number goes up considerably because they can target small gold deposits that large scale miners often would not consider.

### Potential Solutions to Mercury Use in ASGM

It is important to look at the different techniques employed in processing gold and how mercury is used to understand how mercury is released into the environment. Mercury often escapes into the tailings which slowly emits mercury into the atmosphere and into waterways. When amalgam is formed and burned, mercury is emitted into the atmosphere. When gold is brought to the gold shop and it is further refined, the remaining mercury in it is also released into the air. And this can happen in the field, in a city or heavily populated areas resulting in high mercury emissions in these areas.

The amount of mercury used varies with the style of operation. When the whole ore is amalgamated, much more mercury is lost. If gold is separated using gravity concentration before amalgamation, much less mercury is used. It is a better way of using mercury, and perhaps one of the solutions to reduce excessive mercury use in ASGM.



**Why mercury is used**

There are lots of reasons why mercury is used. It is easy, it is very independent. And this is not true for other technologies. It is highly effective at capturing gold under field conditions, accessible and cheap. Mercury also facilitates precise transactions. Mercury can be used to trade gold without being robbed when selling the gold. Mercury also produces quick capital and serves as a method to divide profits. Another reason is that miners are not aware of the risks and they often have no other choice. In many cases miners are not aware of alternatives if they do exist, or do not have the capacity to practice them. Indeed, there are things that have to be appreciated when one plans to intervene in a small-scale mining community. It is thus important to understand why the people are using mercury in the first place.

**Case studies, different mercury scenarios**

In Sulawesi, Indonesia, under primary mining, miners practice whole ore amalgamation and about 20 units of mercury is used for every unit of gold produced. In Kalimantan, Indonesia where the situation is alluvial mining, gravity concentrate amalgamation is used where the miners utilize 1.3 units of mercury per unit of gold produced, which is about 20 times less than in Sulawesi. In some places where the gold is very coarse, one can actually get a reasonable amount of gold without using mercury.

From the case studies, it can be shown that the use of cyanide has grown rapidly in small-scale gold mining mostly because it gets more gold. But the problem is they are mixing cyanide with mercury especially when they apply cyanide to mercury-contaminated tailings. And this opens a big research gap on cyanide-mercury interactions. What is known is that cyanide dissolves mercury just like it dissolves gold. So that when the liquid is released from the cyanide plant that has mercury in it, dissolved mercury complexes can flow along distance much further than when cyanide is not used. Also when the cyanide degrades in a tailings pond, mercury is released to the atmosphere. This is thus a growing problem and as cyanide is improperly used, it continues to hurt the gold industry in general. So this is a good reason to introduce best practices.

**Potential Solutions**

In trying to find appropriate solutions to the problem, it is important to look into the technological, financial/market and policy aspect as well as local, regional and global actions. For poor people, profit is an important incentive for creating sustainable change in any ASGM operation. Miners care about stability, dignity and health but to lesser degree than profit. Asking miners to change their behavior in a way that induces a pay cut has been universally unsuccessful.

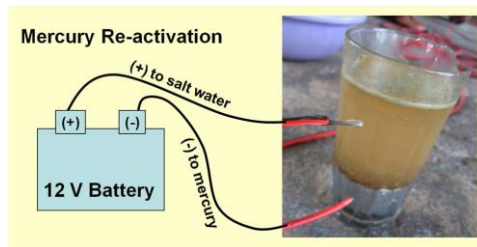
In terms of technical solutions, it involves two-step process. First is the introduction of alternative processing that uses lower mercury in the production of gold. After establishing good relationship with the miners, more sophisticated methods that do not use mercury may be introduced. The first step consists of mercury recycling which is emissions control with the use of fume hoods and retorts and mercury re-activation. This can be done through widespread education on alternative processing techniques. Rather than amalgamating the whole ore for instance, miners can use the gravity concentrate first before applying a little amount of mercury. This will result in the reduction of 20 units of mercury to about three units for every unit of gold



which would be a huge improvement. Sluicing does not always work for hard rock or primary ores, so another method which requires a little more capital is the use of centrifuge.

Another alternative that could be introduced is emission control through fume hoods which captures up to 80 percent mercury. For larger amounts of amalgam, retorts are effective. Retorts can easily capture 95 percent or more of mercury in amalgam. Another step is recycling or the re-activation of mercury. When mercury is repeatedly used in amalgamation, its capability to capture gold is weakened. Instead of buying mercury to replace the inactive ones, the use of electrolytic cell can help reactivate mercury.

In terms of financial solutions, the use of the gold market, access to credit for investment in technology, tax incentives, creation of Artisanal Gold Fund to supply lines of credit and the use of existing financial infrastructure may be introduced in effecting change in mining methods. The gold market provides a mechanism for communication with the world's ASGM miners and their governments and can be used to coordinate the improvement of practices and governance.



One of the strategies that may be employed to influence change to the miners is the holding of Technology and Business Competitions where miners demonstrate good mining practices.

There are other ways that governments can become involved in raising awareness. Tapping existing education programs is a very efficient way of getting the message reaches the small-scale miners.

To support the transition to cleaner gold production, one of the strategies is to have successful pilot projects which can be funded and tested, fine-tuned and replicated in other areas.

### 3.7. CASM initiatives, challenges and opportunities in Asia

Dr. Victor Maglambayan

Communities and Small-Scale Mining (CASM) is a multi-donor networking and coordination facility based in Washington DC its main donors are the DFID (Department for International Development) of UK, Denmark, the World Bank and others. It was launched in March 2001. There are CASM groupings within CASM and CASM Asia is one. There is also the CASM Asia-Pacific that is administratively being hosted by the Coordinating Committee of Geoscience Programmes in East and Southeast Asia (CCOP) in Bangkok, Thailand. CASM-Asia is a cooperation network and the MGB represents the Government of the Philippines in this body while the CASM Asia-Pacific is the more official group. The workings of CASM Asia-Pacific are now placed as a contribution to the CCOP which is reported to the permanent Representative of Japan to CCOP.

#### CASM initiatives in the Philippines

From 1999-2000, several researches were carried out on small-scale mining mostly funded by the Japanese government. Among the issues tackled include the use of mercury, contamination of watersheds and other associated problems like landslides and health security in small-scale mining sites. As to sustainability, the group tried to inform the small-scale miners in Benguet about some aspects on entrepreneurship.

In 2004, the National Institute of Advanced Industrial Science and Technology in Japan came up with another book entitled "Risk Communication between Mineral Property Developers and Local Communities". The group was also responsible in organizing two meetings one of which was to study the business practices of small-scale gold miners in Benguet. The aim of the meeting was to educate the small-scale miners about the government instruments that can assist them to increase their productivity. Speakers for concerned government agencies were invited.

Also in 2004, CASM also presented its scientific findings on mercury contamination to the village of Bua, Itogon, Benguet. Government officer from the MGB was also invited to explain the effects of mercury intoxication. It appeared that the small scale miners, even when confronted by scientific facts on mercury contamination tend to deny possible negative effects on their bodies. It also highlighted that there are differences in the way people perceive the risk around them.

#### CASM benefits

CASM meets annually. From the group, there is learning and sharing of information and experiences. The group is also looking at some innovations and solutions as it endeavors to find solution to help control the problem of unregulated mercury use in small-scale mining. CASM also provides opportunities for networking. There is also a sense of community that is engendered among people from different countries advocating for the same solutions and same higher goals.

**Challenges in conducting the initiatives**

1. Local initiative, rather than international aid. In most of the meetings conducted in the past, the small-scale miners are a little reticent about putting up a local initiative to what is perceived to be possible solutions to the problem. It seems like Filipinos are looking more towards international aids most of the time.
2. Identifying wrongdoers is not the goal. In meetings like those, the miners are often looking to pinpoint who the wrongdoers are. This should be minimized.
3. Large mining stakeholders are reluctant to contribute in the discussions about problems of small-scale mining.
4. Miners have this resistance to the “you need this” stance.
5. There’s a need to give small scale miners ownership of the problem because they are themselves the ones that are affected by any contamination or any health problems in their areas of work.
6. Miners want microfinance instruments. However, it seems they only need to get themselves better organized.
7. Even when confronted with scientific findings, there is a psychological bias. They say that they can control mercury and that their bodies are strong enough to protect against mercury.
8. Risk is perceived differently by different people.
9. Language (and science) can be a barrier. Language can be a problem, not just the language of the people but also the language of science.

**Discussion notes:**

- One of the reasons why some of the projects were not successful is the way by which miners perceive the problem presented before them. Another reason is the lack of more cohesive coordination among stakeholders.

### **3.8. Assisting Marginalized Sectors to way(s) out of poverty through productive activities**

Ms. Hazel Alfon

Official Representative of the Department of Agriculture to the  
United Nations Industrial Development Organization (UNIDO)

#### **About UNIDO**

The United Nations Industrial Development Organization (UNIDO) is a specialized agency of the United Nations mandated to promote and accelerate sustainable industrial development in developing countries and economies in transition. In line with the global forum and international cooperation functions, the comparative advantage of UNIDO in the Philippines is its ability to make significant and holistic contributions to strengthen the competitive advantage of Philippine industries through its key thematic priorities – (1) poverty reduction through productive activities; (2) trade capacity building; and, (3) energy and environment.

UNIDO's thematic priorities are the pillars for Philippine industries to become globally competitive – contributing significantly to national economic growth, while at the same time, providing the marginalized communities with opportunities for better quality of life through productive activities. One of the poverty reduction models being optimized by UNIDO is in the Energy and Environment Partnership Project where they help bridge marginalized agricultural communities to the supply chain of medium- and large-scale companies.

In realizing its mandate UNIDO employs four procedures namely:

1. orchestration of efforts to develop the sector, industry or the subsector
2. understanding the sector, subsector or industry
3. strategizing
4. intervention

Under the first procedure, there is a need to determine the magnitude and scale of the issue and assess whether the agenda is in line with the priorities of the Philippine Government. Under the second procedure, basic information as to the functions as well as the participants in the sector, subsector or industry will be gathered. The third procedure includes strategizing about how a multiple bottom line approach industry development should be designed. After identifying the magnitude of the issue, appropriate interventions for different set of participants will be formulated taking into account the participants that can help solve the issue, how efforts are orchestrated to attain the goals and how the investment on the project address the issues of poverty, health and safety, environmental sustainability, etc.

### 3.9. Health and Environmental Impact of Mercury in the Philippines

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Supervising Health Program Officer, Environmental and Occupational Health Office  
National Center for Disease Prevention and Control  
Department of Health, Philippines

#### Mercury problem in the Philippines

The problem on mercury use and emission in the Philippines comes from various sources and activities. Large-scale and small scale mining as well as abandoned mercury mines, coal-fired power plants, chlor-alkali industries and other industrial activities, from various institutions such as the hospitals, schools and households and from natural sources.

#### Background of mercury problem in ASGM

In the mid-80's, gold miners engaged actively in processing the ore using the crudest method of gold extraction by amalgamation. The discovery of new gold rush areas and the desire of miners to increase their gold production have resulted in the improper use of mercury during gold smelting and uncontrolled disposal of mercury wastes into the environment. Studies show that some 26 tons of mercury are dumped annually into bodies of water in Mindanao. Small-scale mining operations have polluted tributaries and water systems resulting in fish kill aside from adversely affecting the cattle/livestock industry and agricultural production.

#### Health studies on mercury

Studies have been carried out to determine the health and environmental effects of mercury especially to the miners and their children. The findings are summarized below:

- There is a significant association of blood mercury levels with the duration of work of small-scale miners. The longer they work in the mines, the more they can be susceptible of having elevated levels of mercury in their blood.
- A physical examination of selected school children in Apokon, Davao del Norte found out high levels of mercury among schoolchildren examined, attributed mostly to their simultaneous exposure to inorganic and methyl mercury. The physical examination also showed that predominant findings include underheight, gingival discoloration, adenopathy, underweight and dermatological abnormalities among children examined
- An investigation conducted among miners in Diwalwal reveals that among those clinically examined, a fair amount of workers showed severe symptoms that could be very well related to the classical picture of mercury intoxication. Symptoms include fatigue, tremor, memory problems, restlessness, loss of weight, metallic taste and sleeping disturbances. Intentional tremor, mainly fine tremor of eye lids, lips and fingers, ataxia, hyperreflexia and sensory disturbances as well as bluish discoloration of the gums were also observed.
- A survey on the Knowledge, Attitudes and Practices Related to Mercury Poisoning Results (KAP) showed that miners were significantly more knowledgeable about mercury poisoning, its hazards, its causes and methods of prevention than non-miners. The sources of information include personal interaction with relatives, co-workers and health personnel. Tri-media, which includes posters, radio, pamphlets, newspapers and

comics, among others, is also found to be an effective channel of communication to miners.

### **Recommendations**

These studies provide very good insights on how to raise the level of awareness of miners on the dangers of mercury intoxication. First, there is a need to strengthen IEC initiatives. The provision of training to rural health personnel to enable them integrate mercury prevention initiatives into the regular health services of the Rural Health Unit (RHU) can also be helpful. The results of the KAP survey can also be utilized in formulating key messages for the information, education, and communication (IEC) campaign.

### **Health and environmental assessment**

In collaboration with the International Atomic Energy Agency, UP-NPMCC and National Institute for Minamata Disease in Japan, health and environmental assessments were conducted from 1999-2003. Health assessment involved, among others, face to face interview with respondents, comprehensive medical and neurological examination including a modified mental status examination, biological monitoring (blood, hair, urine samples), laboratory examination and urinalysis. The environmental assessment involved establishment of sampling stations based on the selection of study site to assess drinking water supply, river quality, effluent discharge, sediment/soil contamination, air quality (ambient/personal/workplace) and marine life.

### **Fish Advisory**

Based on the findings from the monitoring of mercury levels in fish, the Department is set to prepare an advisory to inform the public about fish species that are safe for consumption and those that are not advised to be consumed by the general public due to elevated levels of mercury in them. Among those not advised to be consumed by the general public are:

- a. talakitok from Davao City
- b. bariles, balo, maya-maya and malasugue in Tagum
- c. bariles, barracuda and malasugue in Saranggani
- d. pinya-pinya from Mati
- e. ilac from Lapon
- f. malasugui from Pantukan
- g. bariles (domestic consumption) from DPM-General Santos

### **Role of the Local Government Units (LGU)**

The role of the local government units is very important. In Apokon for instance where health findings showed exposure of schoolchildren to mercury from the ball-milling operations, the LGU established a zoning ordinance and caused the closure of ball-milling operations near institutions.

### **What needs to be done**

In terms of regulations, there is a need for continuing health and environmental monitoring to provide policy makers with important data. Training of miners on alternative environmental-friendly technology in the extraction of gold from the ore is also important. There is also a need to integrate the cost for health, environment as well as clean up and remediation whenever we talk about small-scale gold mining. We also need to continue our advocacy on the toxic effects

of mercury and strengthen collaborative linkages with international organizations /non-government organizations.

**Discussion notes:**

- One of the reasons why the DOH's awareness campaign on the ill-effects of mercury is quite effective is the formulation of key messages for a specific target audience based on the knowledge, awareness and practices survey previously conducted. For instance, protecting their health is not really a concern for miners, but if the message focuses with the effects of mercury to the health of their children, the message sells.
- There is a need to re-evaluate the process of getting water samples considering that mercury is very insoluble in water.

### **3.10. Mercury Management initiatives by the Ministry of Health in Cambodia**

Dr. Sok Srun  
Deputy Director  
Department of Hospital Services, Cambodia

The current sources of mercury in Cambodia are coal-fired power plants, cement production, small-scale gold mining and chlor-alkali production. Mercury is also released from waste treatments like incineration, cremation, in landfills and from recycling and storage facilities. Methyl mercury is a powerful neurodevelopmental toxicant which impedes nerve cell division and migration, binds with microtubules required for neuronal development and distorts DNA & RNA. Mercury also causes acrodynia (pink disease), pain in the extremities, pinkish discoloration and desquamation, hypertension, sweating, insomnia, irritability and apathy. Typical symptoms of chronic metabolic mercury intoxication include tremor, ataxia, coordination problems, excessive salivation and metallic taste.

Among the healthcare sources of mercury in Cambodia are medical waste incinerators, open burning, burning in barrel, gasification, pyrolysis etc., thermometers, sphygmomanometers, dental amalgam, gastrointestinal tubes, laboratory chemicals, pharmaceutical products and electrical appliances.

#### **Ministry of Health initiatives on mercury**

To address the issue on mercury, the Kingdom of Cambodia came up with a Policy on Health Care Waste Management (HCWM) although this is primarily focused on solid waste. Pursuant to this, a regulation on HCWM was promulgated and a strategic Plan from 2008 to 2015 was formulated. Certain responsibilities were assigned to various offices in the Ministry of Health from the national to the local level. Pilot projects on HCWM are also implemented with three hospitals and posters for waste containers were developed and set up.

The implementation of the program on mercury is however constrained by the absence of recorded data on mercury, no mechanism for research on mercury in mine, inadequate information on mercury prevention and control procedure, and lack of knowledge to monitor and provide intervention. No information, communication and education materials are also available for training.

In view of the foregoing, the following are recommended:

1. Technical and financial support from both UNEP and WHO in the development of a short, medium and long-term national plan on mercury.
2. Human resources development through training and building up of local capacities, which may include distance learning on mercury.
3. Conduct inventory and survey on mercury.
4. Develop a technical guideline on mercury treatment.
5. Conduct national dissemination workshop for MoH.
6. Integrate mercury concerns in the Annual Operation Plan.
7. Develop IEC for trainings to general people.



### **3.11. Establish an international network on mercury intervention. Sustainable Development Challenges in ASGM**

Imelda E. Perez  
Coordinator, Mining Governance Project  
Ateneo School of Government, Philippines

In 2007, the Ateneo School of Government has embarked on a project entitled “Reforming Environment and Natural Resources (ENR) and Mining Governance Project.” It starts out with the recognition that mining as an industry is promoted by the Philippine government as a major source of revenue and a lot of promotional activities therefore are stepped up by the government. The promotional activities have highlighted the division of various sectors. It has also heightened the conflicts between large-scale mining and the small-scale mining sectors, between the civil society organizations and the government that is promoting it.

When the Ateneo School of Government thought of a project, it has identified three elements in the beginning. First element is the conduct of research to determine what the conflicts are, their sources, and how the sources can be managed. Second element is the intervention which includes mediation and arbitration when needed. And, third is education and training.

When the program started, initial definition of local governance was formulated taking into account the sectors that are involved which is not necessarily confined to the local government units but also includes other stakeholders. The project started out with a study, and was able to map out conflicts in mining communities.

Initially, the project was focused on large-scale mining communities but eventually it has realized that conflicts also arise in small-scale mining communities. The conflicts identified include unclear roles and delineation of powers between the National Government and Local Government Units (LGUs) when it comes to issuance of permit for mining applications. While it is said that the national government issues permits to large-scale mining communities, the Local Government Code requires prior endorsements from the indigenous peoples and local communities. There is also the lack of capacity of LGUs to properly govern environment and natural resources and therefore, there is a weak capacity of the LGU to govern mining as a part of the ENR. There are also inadequate transparency and accountability mechanisms in place. The processing of permits for instance is not as transparent as desired.

#### **Sustainable development scorecard**

The sustainable development scorecard as used by the businesses especially the mining corporations can also be used to rate and identify the sustainable development challenges in artisanal and small-scale gold mining. The scorecard is often referred to by the large mining corporations as 3Ps – people, planet and profit. The scorecard simply involves the negative and positive assessment of the 3Ps. In terms of the first P or people, ASGM is acceptable because it brings food on the table, it provides employment. It is a family enterprise. It involves, the father, the mother down to the children. It engages indigenous peoples (IPs) and put children to school. However, it is rated negative as well because while it is true that it brings food to the table, there is a question of food safety and food security. Although women participate substantially in

mining activities, their contribution is not also factored in the equation. ASGM also involves children who usually work under horrible conditions.

With respect to access to social services, there are only elementary and secondary schools in mining communities but no tertiary schools. There are health clinics and community hospitals but most of them are not adequately trained and capacitated to address mining-related diseases and emergencies. Small-scale mining is largely illegal and therefore social services or government services are quite distant. There are also community health issues.

Part of the people issues are the conflicts with large-scale mining companies. The IPs and small-scale miners are actually excluded from traditional mining areas. There is also a perception that small-scale miners are utilized as 'sniffers' of minerals and are actually utilized as frontliners by large scale mining companies. There is also an emerging practice in Benguet where large-scale mining processing facilities are used by the small-scale miners at reasonable rates.

With respect to the second P – planet, it is quite difficult to find positive indicators for planet from ASGM. On the negative side, there is this nagging question: Does small-scale mining present the “greatest environmental disaster-in-the making?” Another question that might be posed is: Who pays the cost? There are also negative impacts from every phase of gold production.

With respect to the third P – profit, the contribution of mining including ASGM to the Gross Domestic Product is 3 percent. ASGM can however contribute more with the use of safe processing technologies. The aspect of profitability should also factor in the wages and benefits, resource use, labor and human capital.

### **Recommendations**

Foremost is to stop the use of mercury and this needs a lot of education for all the stakeholders. There should be a nationwide information campaign. Schools, medical personnel, mining boards and stakeholder groups and LGUs should be provided with information and should be mobilized to disseminate the information. There is also a need to create monitoring teams on use of mining and processing techniques to reduce mercury and innovate or devise techniques and technologies that are alternative to use of mercury.

Institutional capacity is a significant means for facilitating movement towards sustainable development. In this regard there is a need to strengthen Provincial Mining Regulatory Boards (PMRBs) to enable them address crucial questions including disaster risk management, conflict management, sharing of and updating technology. It is also necessary to mobilize the academic/research and scientific community to enable the general public to better understand ecological and social processes, efficient resource utilization, and systematic assessments of current conditions and future prospects. There is also a need to facilitate interdisciplinary research and better communication between scientists, decision makers, and the mining communities. The government should invest in science and technology and earmark a percentage of the taxes and revenues from mining for the development and dissemination of alternative and safe technologies. Make the development of mining communities a core component of local development plans.

### **3.12. Environmental Education in Cambodia Focusing on Hazards Chemical Management (including mercury)**

Mr. Roath Sith  
Ministry of Environment, Cambodia

The Ministry of Environment plays an important role in promoting environmental education (EE) in Cambodia by providing environmental knowledge to, and strengthening the capacity of officers. In 1995, there was a program to integrate environmental concerns into the curriculum. Mass media was also used in raising and enhancing public awareness on environmental issues. The Ministry also played an important role in coordinating environmental education activities with various stakeholders including the civil society. In integrating EE in the formal education system, several materials were produced including a Manual on EE for Primary School, Guidelines for EE and posters. The Secular Secondary School system has chemicals as a stand alone subject although it does not focus on chemicals hazard, safe use and health prevention concerns.

Non-formal education activities carried out by the government of Cambodia include community trainings, awareness raising activities through environmental campaigns on special events, radio programs, youth environmental debate (aired on TV with national coverage), quarterly production of environmental magazines, booklets, posters, leaflets and brochures. Private sectors including religious groups also provide support in non-formal environmental education awareness.

#### **Opportunities and barriers**

There are opportunities for enhancing environmental awareness through the formal education system. While environmental issues/study has been integrated into curriculum, MOE is willing to accept new environmental issues to be integrated into curriculum. However, potential barriers for the growth in environmental education have been identified and these are:

- Limited cooperation and coordination/networking between government & NGOs
- Limited knowledge of EE activities
- Limited capacity and resources on EE
- Limited materials and facilitation equipment for EE
- Inadequate strategic planning for EE
- High percentage of illiteracy
- International aids focus more on environmental conservation and pollution prevention issues

As regards the future directions of EE in Cambodia, there is an initiative to develop and implement a National EE Strategic Plan, produce information tools for EE and develop and mobilize human resources for EE. ASGM and mercury concerns may be considered in these initiatives. It appears that there is a need to strengthen EE programs relating to ASGM and mercury use and pollution. To address this, the following are recommended:

- provide training for gold miners and officers in charge;
- intensify awareness raising activities;
- provide environmental knowledge to in-services and pre-service teachers on chemical hazard communication and prevention.

### 3.13. Legal and Policy Framework for ASGM in the Philippines

Mr. Metudio Turbella  
Regional Director, DENR-EMB Region XI  
Philippines

#### Diwalwal gold rush area

The Diwalwal gold rush area in the municipality of Monkayo, Compostella Valley is one of the top gold producers in the Philippines. Gold deposits in the area were discovered in 1983 while small-scale mining operations peaked in the mid-80s. Mining activities in Diwalwal is highly concentrated in barangay Mt. Diwata. Based on the inventory conducted, there are 26 tunnels in Mt. Diwata extracting 80 to 100 metric tons of ore per day. About 8 to 12 grams of gold is produced for every metric ton extracted. Gold is processed using 2 continuous-type carbon-in-pulp (CIP) plants, 48 combined ball mill and batch-type CIP plants, 18 batch-type CIP plants and 318 ball mill establishments. There are 65 gold processing plants, 263 ball mills and motor mills.

For more than 20 years, however, the mining area has been confronted by the following problems:

- rivalries and violence (ambuscades and barricades) among miners, operators and communities;
- fatal accidents (due to tunnel collapses and landslides);
- contamination and siltation of Naboc River (from discharged mill tailings);
- mercury intoxication of miners and residents;
- unsanitary health conditions (absence of sewerage and garbage disposal systems);
- poor housing and living conditions;
- inadequate educational facilities and health services; and
- uncollected taxes due to government (from unpermitted mining operations).

#### Legal and policy framework

The Philippines have several laws and regulations that deal directly and indirectly with ASGM and mercury management. Below are some of the known laws:

#### Artisanal and Small-scale Gold Mining

1. Presidential Decree 1899 – establishing small-scale mining as a new dimension in mineral development
2. Republic Act No. 7076 – People’s Small-scale Mining Act
3. Republic Act No. 7942 – Philippine Mining Act of 1995
4. DMC 2007-07 – Issuance of guidelines to harmonize pertinent provisions of mining laws
5. DOH Circular 22-C & DENR AO 97-30AO 92-34 – guidelines and measures for the safe usage of mercury

#### Mercury Management

1. Republic Act No. 6969 - Toxic Substances and Hazardous and Nuclear Waste Act
2. Republic Act 9003 – Ecological Solid Waste Management Act of 2001
3. Republic Act 8749 – Clean Air Act of 1999
4. Republic Act 9275 – Clean Water Act of 2004
5. Administrative Order No. 97-38 or the Chemical Control Order (CCO) for Mercury

**PD 1899 and RA 7076**

The principal laws governing small-scale mining in the Philippines are PD 1899 and RA 7076. PD 1899, the first known law to govern small-scale mining in the Philippines was issued in 1984 in recognition of the increasing economic impact of the small-scale mining sector. The law was intended to develop small mineral deposits, generate income for the poor and alleviate the living conditions in the rural area.

Among the important features of PD 1899 include the requirement for the holders of mining rights to secure small-scale mining permits/licenses which shall be valid for two years and renewable for the same period. Said law also exempts holders of permits/licenses from the payment of all taxes, except income tax.

RA 7076 was passed in 1991 to further promote, develop, protect and rationalize small-scale mining activities, generate more employment opportunities and provide an equitable sharing of the nation's wealth and natural resources. Said law defines artisanal and small-scale mining as: "mining activities which rely heavily on manual labor using simple implement and methods and do not use explosives or heavy mining equipment." It also describes small-scale miners as Filipinos who voluntarily form a cooperative duly licensed by the Department of Environment and Natural Resources to engage in the extraction or removal of minerals or ore-bearing materials from the ground. Below are some of the significant provisions of RA 7076:

- Establishment and implementation of a People's Small-Scale Mining Program to be implemented by the DENR in coordination with concerned agencies.
- Creation of a Provincial/City Mining Regulatory Board which shall be composed with:
  - a. DENR representative as Chairman
  - b. Representative of the governor or city mayor, as the case may be
  - c. One (1) small scale mining representative
  - d. One (1) big-scale mining representative
  - e. Representative from a non-government organization who shall come from an environmental group. The Board shall be under the control and supervision of the Secretary of DENR.
- Declaration of People's Small-scale Mining Areas and awarding of Small-scale mining contracts by the Board.
- Registration with the Board of all persons undertaking small-scale mining activities.
- Recognition of the rights of cultural communities in the award of small-scale mining contracts.
- Establishment of a small-scale mining protection fund.
- Sale of gold produced by small-scale miners to BSP or its duly authorized representative

**Philippine Mining Act (RA 7942)**

RA 7942 was passed in 1995 but took effect in 2004 after its constitutionality was finally resolved by the Philippine Supreme Court. While Section 42 thereof provides that small-scale mining activities shall continue to be governed by PD 1899 and RA 7076, the law has other provisions which have direct and indirect effect on the operations of small-scale miners. By virtue of RA 7942, small-scale mining permit holders and contractors are also required, on top of the requirements demanded under PD 1899 and RA 7076 to:

- to secure an environmental impact report;

- a final mine rehabilitation/decommissioning plan, compliance certificate from the regional offices of the DENR's EMB; and
- submit a potential environmental and a community development and management programme (CDMP) duly approved by DENR's MGB

**Republic Act 6969**

The principal legislation on mercury in the Philippines is Republic Act 6969. The law covers the importation, manufacture, processing, handling, storage, transportation, sale, distribution, use and disposal of all unregulated chemical substances and mixtures in the Philippines, including the entry, even in transit, as well as the keeping or storage and disposal of hazardous and nuclear wastes into the country for whatever purpose. The law's Implementing Rules and Regulations (IRR) included mercury and mercuric compounds in the table of prescribed hazardous waste.

**Other related laws**

- Local Government Code of 2001 (Republic Act 7160)  
Enforcement of the provisions of the small-scale mining law as well as the pollution control law has been devolved to provincial LGUs by virtue of Section 17(3)(iii) of said law.
- National Integrated Protected Areas System (NIPAS) Act of 1992 (Republic Act 7586)  
The law punishes the following acts within the Protected Area: (a) Dumping of any waste products detrimental to the protected area, or to the plants and animals or inhabitants therein; (b) Squatting, mineral locating, or otherwise occupying any land; (c) Constructing or maintaining any kind of structure, fences or enclosures, conducting any business enterprise without a permit; and (d) Leaving in exposed or unsanitary conditions refuse or debris, or depositing in ground or in bodies of water. [Section 20 (b)(f)(g)(h)]
- Wildlife Resources Conservation and Protection Act (Republic Act 9147)  
The law, which took effect in 2001, penalizes the dumping of waste products detrimental to wildlife, mineral exploration and/or extraction in critical areas. [Section 27 (c) in relation to Section 28 of RA 9147]
- Indigenous Peoples Rights Act (IPRA) of 1997 (Republic Act 8371)  
The law grants the indigenous peoples/indigenous cultural communities (IPs/ICCs) the right to develop their lands and natural resources, to safe and clean air and water, to regulate the entry of migrants into their domains and to protect their indigenous cultures, traditions and institutions. Unlawful intrusion upon any ancestral lands or domains is punished in accordance with the customary laws of the IPs concerned.

**CCO for mercury and mercury compounds**

Administrative Order No. 97-38 or the Chemical Control Order (CCO) for Mercury was issued pursuant to RA 6969 for the following objectives:

- Reduce hazards to health and the environment from the use, handling, management, transport and disposal, and subsequent release and exposure to mercury.

- Establish requirements and procedures for importation, transport, manufacturing, labeling, re-labeling, spill handling, emergency procedures, and proper treatment, storage, and disposal of mercury and mercury compounds.
- Establish limitation of use of certain mercury and mercury containing substances.
- Establish registration, monitoring and compliance program to enforce the tenets and covenants of this Order.

**Limitations/Restriction of Use**

The Order provides that the use of mercury and mercury compounds shall be strictly limited to the following end-users [Sec. 7 (3)]:

- Chlor-alkali plants
- Mining and metallurgical industries
- Electrical apparatus (lamps, arc rectifiers, battery cells and others)
- Industrial and control instruments
- Pharmaceutical
- Paint Manufacturing
- Pulp and paper manufacturing
- Dental amalgam
- Industrial catalyst
- Pesticides (fungicide) production or formulation

### **3.14. Legal and Policy Framework for ASGM in Cambodia**

Mr. Sam Sidara  
Ministry of Industry, Mines & Energy  
Cambodia

At present, Cambodia has no existing law on artisanal and small-scale gold mining. However, the law on Management and Exploitation of Mineral Resources that was enacted in 2001 has direct and indirect implications on artisanal and small-scale gold mining activities. The law provides, among other things, that license for artisanal mining shall only be granted in areas with loose and unconsolidated soil, sand, gravel and stone. The mining area awarded should not be more than one hectare nor more than five meters deep.



### 3.15. Implementation of the Project at the National Level in Cambodia

Mr. Sarun Sambo,  
Project Coordinator, DEPC, MOE  
Cambodia

The Project Coordinating Unit for ASGM has been set up in Cambodia. The Inter-Ministerial Technical Group for Coordinating International Conventions and Agreements related to Chemicals serve as the unit's Steering Committee (SC). The SC, which was established by MOE will act as a project board by directing project implementation and reviewing and adopting project outputs.

The project operational plan which commences by January 2010 and ends by February 2011 has been drafted and initial funding has been allocated.

#### Challenges in drafting the plan

In drafting the national strategic plan, the following challenges are foreseen:

- Limited data and information
- Limited knowledge in formulating strategy, priority setting, and reviewing action plan
- Need more technical workshop/meeting to review the draft by stakeholders
- Need time and resources to do inventory (to get primary data) for gathering scientific data and information for formulating the draft strategy

To overcome these challenges, the following are needed:

- Conduct full inventory for ASGM
- More trainings for officers and decision makers on strategy and action plan development
- Resources to implement the strategy

The Inter-Ministerial Technical Group for Coordinating International Conventions and Agreements related to Chemicals which was formed by 12 ministries and 4 NGOs serves as the National Committee to coordinate the implementation of environmental conventions and agreements related to chemicals issues.

The National Committee (NC) performs as Secretariat to technical groups studying the obligation and requirement of the country to conventions/agreements, proposes national policies and plans for sound management of chemicals to decision makers and provides comments and feedbacks on the draft legal instruments and national action plans related to sound chemicals management (SCM). The NC also studies and evaluates the issues and gaps for SCM at the national level and reports to decision makers for further consideration; collects and receives information related to chemicals at international, regional, and national to be reported to institutional leaders for actions; and coordinates with other projects, programs, research activities that involved with the implementation of international conventions, treaties, protocols and agreement on SCM.

### 3.16. Philippine Mercury Inventory and Action Agenda

Atty. Richard Gutierrez  
Executive Director  
Ban Toxics!

Pursuant to Republic Act 6969 and its IRR and the Chemical Control Order (CCO) on mercury, the Environmental Management Bureau of the DENR is mandated to have records of all the importer, manufacturer, distributor and purchaser, the end-use category of mercury or mercury-containing products, quantity of products supplied, and the quantity of wastes produced as a result of manufacturing and industrial use. The database was not however realized. In 2002, UNEP came up with a global assessment report on mercury and mercury compounds with the aim of promoting environmentally sound management and to contribute in raising awareness and understanding among key decision makers of major issues related to the toxic substance. In 2008, the UNEP inventory toolkit was piloted in the Philippines with the participation from various government agencies, private sectors, NGOs and academe who formed a multi-disciplinary inter-agency Technical Working Group.

During the data gathering, series of consultation workshops were held in major cities where questionnaires were administered with identified respondents. In view of the fact that it is quite difficult to generate the needed information, data available and those obtained from various sources were calculated using reasonable assumptions and basing from the calculations for using the maximum and minimum input factors as suggested by UNEP toolkit.

#### **Situation and Gap Analysis**

The mercury inventory assessment for the Philippines presents an indication of the pattern of emissions and sources of large generators of mercury which could be targeted for control measures. The toolkit provides an easy template to guide the users in estimating the amount of mercury emissions to the environment. Its major drawback however is the wide range of input factors. The toolkit results in about 75 percent increase in maximum values from minimum values. This is considered significant and warrants a second look at the toolkit and the country inventory assessment for the Philippines.

Results of the inventory showed that primary virgin metal production with includes small-scale gold mining accounts for 74,769 kilograms per year which is about 32 percent of the country's annual mercury emission. The same inventory also revealed that bulk of the emission goes into the air.

#### **Mercury action plan**

With the results, the Philippine government came up with an Associated Mercury Action Plan with the aim of reducing risk to human health and contamination of the environment from anthropogenic use and release of mercury and mercury compounds, enhancing coordination and cooperation among concerned sectors (e.g. industries, importers, educators, NGOs), intensifying source reduction and recycling activities and improving source emission controls.

The plan embodies 7 action agenda with corresponding timelines for their implementation.

## 4. Break-out Session Design and Outputs

For the break-out session, the participants were divided into two mixed groups and were made to answer the questions provided under the UNEP Guidance Document. The first group was made to answer Basic Sectoral Profile Questions while the second group was asked to provide input on Environmental and Social/Legal Questions. Below are the specific actions asked, the outputs, as well as the summary of the issues raised during the open forum that followed.

### Basic sectoral profile questions:

- How many people are engaged in ASGM mining in your country?
- Where does mining take place within the country (throughout, or concentrated geographically?)
- Who does the mining – family landowners, migrant workers, immigrant workers, workers hired by landowners? Are women and children involved in the work? Do they work as individuals, collectively, or how?
- How much gold do these miners produce each year? What price do they get for gold? How much are they typically earning per year (or day)?
- How do the miners get access to mercury? At what price?
- How much mercury do they use to produce gold? [(K)g/mercury per (k)g/gold produced is most useful metric.]
- What are the common technologies and practices used by the miners? Which of these use the most mercury? How is crushing performed? Is mercury added to the whole ore (before or during crushing) or to concentrates? How is amalgamation performed? How is the amalgam burnt?
- How do they purify the gold (if they do) – charcoal stove, gas torch, other?
- What is the local availability of alternative technologies/local workshops? What is the level of local knowledge about alternatives?
- What do the miners think about mercury versus alternatives?
- Who buys the gold from the miners? Where does the purchase take place? Do the buyers process the gold? If so how – do they use any environmental protection methods when processing the gold?

[Please describe how information was obtained and from whom.]

### Environmental Questions:

- What is the scale of the impacts they are having on the landscape (take photos if possible photos)?
- How much habitat (land and water) has been impacted?
- Are there any studies or data on environmental contamination or health impacts from ASGM?

[Please describe how information was obtained.]

### Legal/social questions:

- What is the legal/ regulatory status of small scale mining? If not already legal, what issues could arise with legalization?
- How are miners organized?

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- Do miners have access to capital?
- What is the current system by which miners get gold to market (Who do they sell gold to? Where do they get their mercury? Who are the final exporters?)
- Are miners sensitive to price of mercury?
- Besides miners, who are the key stakeholders at national regional and local levels, including community-based organizations active in mining communities? Please list and provide contact information where possible.

## Group 01 Sectoral Group

### Number of people engaged in ASGM

- In Cambodia, about 4,000 people are involved in small-scale gold mining
- In the Philippines, the number of people engaged in ASGM varies especially if there are gold rush sites; in one site alone the population reached 120,000 people. Another estimate suggests that there are more than 300,000 miners in the country. In the Philippines, ASGM usually involves the family i.e. the parents and their children.

### Location of ASGM sites

- In Cambodia, ASGM takes place usually in far-flung areas.
- In the Philippines, ASGM operations are reported to occur in more than 30 provinces.

### Profile of miners

- Mining activities in both countries are done usually by migrants and transients with their families.

### Data on ASGM gold production

- In the Philippines, ASGM produces 28 tonnes or approximately 80 percent of the country's annual gold production.
- In Cambodia, there is no estimate yet on its annual gold production, although United States Geological Survey reported that in 2003, Cambodia and Laos has a combined production of about 5 tonnes of gold.

### Access to mercury

- Gold buyers are also the main sources of mercury in both countries.
- In Cambodia, mercury comes from Vietnam.
- In the Philippines, there are no registered importers of mercury for ASGM since it is prohibited under the CCO. According to the Bureau of Customs, importation records show that Hg importation is allowed for use only in dental amalgams. However, the neighboring countries in Southern Philippines can be a possible source of Hg for ASGM.

### Amount of mercury used per unit of gold

- Cambodia has no data yet on the volume of mercury used by miners to produce gold.
- In the Philippines, the amount depends on the assay of the ore, which also determines the processing techniques employed. In areas that practice whole ore amalgamation, about 10 to 15 grams of mercury is utilized for every gram of

gold produced. In some areas that practice amalgamation after using the sluice box, the ratio ranges from 1:1; 1:2; 1:3 up to 1:4.

**Common technologies and practices**

- Most common mining practices employed in the Philippines include amalgamation, cyanidation, panning and use of sluice box.
- There are instances where Hg is added during the ballmilling and during panning.
- Blowtorching is the common method for refining the gold. Retort is unknown in Cambodia, while in the Philippines it is known but not practiced.
- Reason cited by the miners for the non-use of retort are the following: (1) slow processing time compared with blowtorching (2) possibility that gold is lost because it adheres to the surface of the burner and (3) consumption of larger amounts of fuel for burning in a retort.

**Gold purification**

- In Cambodia, miners purify gold using blowtorch; in the Philippines, blowtorch is also widely used, while retort is not common.

**Local availability of alternative technologies**

- In Cambodia, no local alternative is available while in the Philippines, the use of cyanidation in SSGM is becoming a viable alternative
- Miners prefer technologies that are cheap and simple to use.

**Gold trading**

- In both countries, there are gold buyers in the area who also sells Hg to the miners. But in the Philippines, the Central Bank buys gold produced from ASGM.

## Group 02 Environment and Legal Group

### Scale of impacts of ASGM into the environment:

- Since most mining operations occur in forest areas, ASGM aggravates deforestation.
- The extent of deforestation caused by small-scale mining may be obtained from the ECCs submitted. But since most miners operate without permits, it may be difficult to determine the number of hectares of forest denuded
- Mountainsides are pockmarked with tunnels, leaving them under the verge of collapsing.
- The difference with respect to the degree of impacts may be also be attributed to the manner of mining (e.g. vertical vs. horizontal)
- Proposals on how the scale of impacts will be measured:
  - a. Rate the impact from 1 to 5 with 5 representing the most severe impact
  - b. Impacts may be ascertained by looking into the reduction of air and quality standards
  - c. Scale of impact may also be determined by comparing it with other sectors (e.g. large-scale mining, agriculture) in terms of environmental damage (e.g. number of trees cut and ore extracted to produce certain amount of gold).

### Philippines

- Siltation and water pollution are two of the worst impacts of ASGM. This is according to the report submitted by regional offices of MGB based on their annual monitoring.
- To determine how much land and water has been impacted, coordinate with concerned government agencies

### Cambodia

- Mining also degrades soils, forests and water quality.
- The impact of mining on land and habitat can not be compared with large-scale mining because there is no large-scale mining operation yet; most of them are under exploration stage

### Studies conducted

- A number of studies have been conducted in both countries to determine the extent of health and environmental impacts of ASGM.

## Legal/Social Questions

### Legal/regulatory status

- As early as 1984, the Philippines recognized the importance of the small-scale mining sector by passing laws (e.g. PD 1899, RA 7076) and regulations setting down criteria for issuance of mining permits
- There is a regulatory platform for ASGM in the Philippines

- In Cambodia, there are no regulations for small-scale mining; any operation is basically extra-legal. In some areas, the provincial governor takes control of mining

#### **Issues for not legalizing**

##### **Philippines**

- Demanding procedures and costly requirements; only 33 permittees covering more or less 400 hectares
- Miners are organized through cooperatives/associations; in one province (e.g. Benguet), miners formed a provincial federation

##### **Cambodia**

- No national policy on ASGM and the government has basically taken a hands-off approach
- The Ministry of Mines and Energy is trying to regulate and control but most mining areas are inaccessible

#### **Access to capital**

##### **Philippines**

- Capital is accessed from gold dealers and local financiers

##### **Cambodia**

- Miners pool their resources to produce the needed capital
- Those who have money also provide capital to miners
- No government funding support for mining

#### **Gold and mercury trading**

##### **Philippines**

- Miners sell their gold to BSP pursuant to the small-scale mining law
- Miners are not sensitive to the prices of mercury but are sensitive on the price of gold
- Gold dealers do not use mercury but since the gold sold to them still contain mercury, gold dealers also contribute in mercury emission during refining (which includes electrowining process) and the contamination of water bodies (e.g. Marilao River in Bulacan)

##### **Cambodia**

- Gold is sold to the market
- Mercury is imported from Laos, Thailand and Vietnam



## 5. Summary of Status, Looking Ahead and Next Steps

Ms. Susan Egan-Keane gave a synthesis of the previous discussions by providing a summary of the status of ASGM in the two countries, focusing on the technical, legal, health, economic and trade aspects in the sector. She noted that while mercury use is widespread, the use of cyanide is also growing. Taking into account the “worst practices” in ASGM, she provided the participants guide questions on how their government will deal with the issues presented as they proceed with the next steps of the strategic planning process. She also laid down possible strategies that might be considered both in planning and implementation.

In building local database on mercury use and emission estimates, Dr. Kevin Telmer suggested the need to collect data from multiple sources, observe and understand gold processing methods, go to the community and stay with miners and match data gathered from the dealers with the data of mercury use in certain mining community.

During the small-group meeting, it was agreed that the draft National Strategic Plans will be submitted to UNEP for review before the INC meeting on June 7, 2010. This will provide UNEP opportunity to identify pilot projects which may be showcased. It is then suggested that both countries develop a clear workplan on how to achieve their goals, develop training curriculums and identify pilot projects for immediate implementation. On top of the proposed contents, the plans are also envisioned to contain stakeholder maps and logical frameworks. The Philippines was also advised to formalize its membership to the UNEP ASGM Partnership by applying as a partner.

## 6. Closing Session

### Closing Message

DENR-EMB Regional Director Gilbert Gonzales delivered the closing speech on behalf of Undersecretary Demetrio Ignacio Jr. In his message, he echoed the issues and problems besetting ASGM as he emphasized the importance of the inception workshop in moving ahead towards the formulation of national strategic plans to address these concerns. He commended the organizing team for bringing together various stakeholders while expressing his hope that the three-day activity will usher a mutually beneficial relationship among agencies involved and help facilitate the strategic planning process. He also expressed his gratitude to the United Nations Environment Program for assisting the Philippines and Cambodia in enhancing regional partnerships and collaboration in addressing the global concern of mercury pollution. He said he also looks forward towards the smooth preparation and fruitful implementation of the plans.

## Conclusions & Recommendations

The inception workshop which drew the participation of important stakeholders in the artisanal and gold mining industry provided a venue for the discussion of important issues as well as proposed solutions to improve gold processing techniques and reduce the threats to human health and the environment. It provided an opportunity for Cambodia and Philippines to share their experiences as well as lessons learned in addressing mercury pollution in ASGM. It has also introduced some of the participants to some local realities such as the gold extraction and processing techniques, mercury and gold trade, the importance of the sector to national economies and the need to take urgent steps to stem the tide of mercury pollution, save the environment from further degradation and protect the miners, their families as well as communities affected from mercury's potent threats. Some useful information on the social, legal and sectoral profile of the sector was also elicited which can be used as substantial inputs in the strategic planning process. Most importantly, the discussions on past and ongoing initiatives as well as the proposed technical, financial and policy solutions present an opportunity for collaboration where efforts and resources can be pooled together to meet the challenges ahead. The workshop would however be more fruitful if other important players have attended particularly those from the small-scale gold mining sector, the gold and mercury dealers and the Local Government Units. It is hoped that these groups will be represented in subsequent activities.

The need to take immediate actions and fast track the strategic planning process is impelled by the fact that while good ideas are traded, new gold rush areas are discovered and consequently more tunnels are dug, waste rocks are produced, forests are denuded, water bodies are contaminated while more miners and their children are exploited and exposed to occupational and health hazards. The Kingdom of Cambodia has already taken significant stride in the process in the sense that its National Committee for the strategic planning has been formed while the Philippines has yet to create its national steering committee which may take six months at the most. But this limitation should not deter the desire of the Philippine government to carry out the preparation of its ASGM strategic plan as it may create an ad hoc technical working group to facilitate the process while working on the legal instrument to formalize the formation of the committee.

And as both countries embark on the preparation of their respective plans, appropriate interventions should be initiated as soon as possible in areas that are feasible and are likely to create significant impacts.

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Attachment A

## **Acronyms & Abbreviations**

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## Acronyms & Abbreviations

ASGM	-	Artisanal and Small-scale Gold Mining
BOC	-	Bureau of Customs
BOE	-	Bank of England
BSP	-	Bangko Sentral ng Pilipinas
BT	-	Ban Toxics
C/PMRB	-	City/Provincial Mining Regulatory Board
CASM	-	Communities and Small-scale Mining
CCO	-	Chemical Control Order
CDA	-	Cooperative Development Authority
CIL	-	Carbon-in-Leach
CIP	-	Carbon-in-Pulp
DAO	-	Department Administrative Order
DENR	-	Department of Environment and Natural Resources
DMC	-	Department Memorandum Circular
DOH	-	Department of Health
DOLE	-	Department of Labor and Employment
DOST	-	Department of Science and Technology
DTI	-	Department of Trade and Industry
EMB	-	Environmental Management Bureau
EO	-	Executive Order
EU	-	European Union
GDP	-	Gross Domestic Product
GEUS	-	Geological Survey of Denmark and Greenland
IEC	-	Information, Education, Communication
INC	-	International Negotiating Committee
LGU	-	Local Government Unit
LSGM	-	Large Scale Gold Mining
MGB	-	Mines and Geosciences Bureau
MIRDC	-	Metals Industry Research and Development Center
MoE	-	Ministry of Environment, Cambodia
MROD	-	Mint and Refinery Operations Department (MROD)
NCIP	-	National Commission on Indigenous Peoples
NIPAS	-	National Integrated Protected Area System Act
PAMB	-	Protected Area Management Board
PCU	-	Project Coordination Unit

PD	-	Presidential Decree
PLGU	-	Provincial Local Government Unit
PSSMA		People's Small-scale Mining Area
QSP	-	Quick Start Program
RA	-	Republic Act
SAICM	-	Strategic Approach to International Chemicals Management
SSMC	-	Small-Scale Mining Contract
SSMP	-	Small-Scale Mining Permit
TWG	-	Technical Working Group
UN	-	United Nations
UNEP	-	United Nations Environment Program
UNIDO	-	United Nations Industrial Development Organization
USAID	-	United States Agency for International Development
WB	-	World Bank
WGC	-	World Gold Council
WHO	-	World Health Organization

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Attachment B

**ASGM Strategic Planning  
Proposed Project Workplan**

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## Proposed Overall Project Workplan – ASGM Strategic Planning Version of 29 January 2010

Timeframe	Responsibility	Deliverable
19-21 January 2010	Philippines	<u>3 Day Inception Workshop in the Philippines.</u> <ul style="list-style-type: none"> <li>The Philippines is responsible to produce the meeting report and organize the meeting (before 26 February 2010).</li> </ul>
26 February 2010	Country	<ul style="list-style-type: none"> <li>National Steering Committee is formed. ToR is submitted to UNEP.</li> <li>National workplan finalized and submitted to UNEP.</li> <li>Data gathering exercise is initially completed by government and results submitted to UNEP.</li> </ul>
1 May 2010	Country	<ul style="list-style-type: none"> <li>Initial draft national strategic plan is submitted to UNEP.</li> <li>This will include, at least, Sections 1-4 of the suggested Table of Contents.</li> </ul>
11 June 2010	UNEP	<ul style="list-style-type: none"> <li>UNEP to provide comments to national governments on the initial draft. This will be both in writing and through networking with partners at the INC meeting.</li> </ul>
7-11 June 2010	UNEP	<u>First Intergovernmental Negotiating Committee Meeting:</u> <ul style="list-style-type: none"> <li>Profile ASGM and these projects at that meeting through a technical briefing.</li> </ul>
15 September 2010	Country	<ol style="list-style-type: none"> <li>Draft national strategic plan is submitted to UNEP.</li> <li>Results Workshop Meeting Agenda jointly developed and finalized.</li> </ol>
November 2010  Date to be confirmed by 11 June 2010	Cambodia	<u>3 Day Results Workshop in Cambodia.</u> <ul style="list-style-type: none"> <li>Regional collaboration and coordination is enhanced through exchange of experiences and lessons learned on a regional level. Awareness of governments and stakeholders is raised through the profiling of the work in Cambodia and the Philippines.</li> <li>The National Strategic plans are strengthened as a result of the discussion at the workshop.</li> <li>Meeting agenda to be developed jointly.</li> <li>Cambodia is responsible to organize the meeting</li> </ul>

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<b>Timeframe</b>	<b>Responsibility</b>	<b>Deliverable</b>
		and for the meeting report which will include feedback on the UNEP Guidance Document.
15 January 2011	Country	National Strategic Plan is finalized following output of the workshop and feedback received from partners.
15 January 2011	UNEP	Final Guidance Document
15 March 2011	Country	National Strategic Plan is endorsed at National level and submitted to UNEP.
15 April 2011	Country	Final Deadline for final expenditure report is 15 April 2011.



# Directory of Participants

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## Directory of Participants

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