Asia-Pacific Economic Cooperation

DEVELOPING TRAINING MATERIALS TO PROMOTE THE REDUCTION OF MERCURY USE IN ARTISANAL AND SMALL-SCALE GOLD MINING

Final Report

APEC SOM Steering Committee on Economic and Technical Cooperation

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APEC Project: MTF 01 2016

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Table of Contents

Executive Summary

The project *Developing Training Materials to Promote the Reduction of Mercury Use in Artisanal and Small-scale Gold Mining* (MTF 01 2016A) was initiated on 16 December 2016 with the Artisanal Gold Council contracted to carry out the project activities.

Overall, the project sought to produce a business training module based on leading global practice in artisanal and small-scale gold mining (ASGM) and designed to promote Minamata Convention compliance. This project is intended to enhance coordination among ASGM education programs throughout the APEC region in support of domestic and international mercury reduction efforts.

Under this project sixty-eight organizations were contacted across six APEC economies and eighteen non-APEC economies to survey for existing and planned curricula and training materials for stakeholders within the ASGM sector, creating an important database of miner training tools that can be accessed by organizations engaged in ASGM miner training and, in particular, mercury reduction efforts. A business training module for ASGM miners was developed which includes teaching materials, student materials, guidelines for instructors, evaluation materials, and additional learning resources. A total of 355 individuals (174 men; 181 women) participated in the business training which was delivered in Indonesia, the Philippines, Papua New Guinea and Peru. A half-day workshop presenting initial project results was held during APEC Mining Week 2018 in Port Morseby, Papua New Guinea and a follow-up workshop was held during APEC Mining Week 2019 in Copiapó, Chile. These workshops gave the contractor an opportunity to share the project results with the greater APEC community, as well as to promote ASGM miner training and mercury reduction in ASGM as key investment priorities for many APEC economies.

Feedback gathered throughout this project suggests that demand for business training in the artisanal mining sector is high. The curriculum developed here serves as a good introductory course and future efforts should be focused on developing more nuanced and customized trainings, including educational materials focussed on bridging the gap between the investment community and the ASGM community.

The products from this project will be made available in an open-access manner to promote the largest possible positive impact for miners, their communities and APEC economies.

Acronyms

AMAN	Alliance of Indigenous Peoples of Indonesia (acronym for organization name in Bahasa)
APEC	Asia-Pacific Economic Cooperation
ARM	Alliance for Responsible Mining
ASGM	Artisanal and small-scale gold mining
ASM	Artisanal and small-scale mining
CIRDI	Canadian International Resources Development Institute
CSM	Colorado School of Mines
CSR	Corporate social responsibility
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOLD	Global Opportunities for Long-Term Development Programme
IGF	Intergovernmental Forum
LSM	Large-scale mining
MRA	Mineral Resource Authority (Papua New Guinea)
MTF	Mining Task Force
NAP	National action plan
NGO	Non-governmental organization
PO	Project Overseer
PNG	Papua New Guinea
SAMS	Sustainable Alluvial Mining Services
SCE	Steering Committee on ECOTECH
UNIDO	United Nations Industrial Development Organization
USDOS	United States Department of State

I. Introduction & Context

Mercury is a potent neurotoxin and major public health hazard whose transboundary migration makes it a pollutant of global concern. The Minamata Convention on Mercury, an international treaty designed to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds, entered into force on 16 August 2017. Eighteen of the twenty-one member economies of APEC have signed or ratified the Minamata Convention.

Artisanal and Small-scale Gold Mining (ASGM) is the largest global source of mercury pollution and is specifically addressed in the Convention. Many ASGM operations use mercury to recover gold from ore as mercury is cheap, easy to use, highly available, reasonably effective, and highly engrained in the gold supply chain, ASGM culture and business practices the world over. Seven of the twenty-one member economies of APEC have ASGM sectors of significant size[1].

Mercury-free gold processing techniques can be cost-effective and often even more profitable than using mercury, but miners must be comfortable incorporating new techniques into their operations. This starts with proper training in several areas such as: formalization, business planning, health and safety, and the operation of mercury-free mining equipment. While there have been some initiatives to develop ASGM training centers and materials, they have generally been stand-alone. Coordination between actors providing training on these and other topics has generally been limited.

Much recent work has focused on the role of the market in creating incentives for mercury-free gold production. For example, several standards for sourcing and producing responsible gold now exist. The Global Environment Facility (GEF) recently launched the GOLD program in which over 180 million[2] dollars will be invested in producing mercury free gold and creating financing models for mercury free production. Despite these efforts, very little effort has been dedicated to ensuring that artisanal miners have the skills to secure and effectively manage the investments required to run mercury free gold processing centers. This gap is the focus of this project.

This project addresses many of the elements in the 22nd APEC Economic Leaders' Declaration from Beijing, China, which specifically highlights sustainable development in mining and the Minamata Convention and the "pivotal role of women in the development and prosperity of the Asia-Pacific." In addition, this project aligns with the 10 APEC Mining Policy Principles, including, inter alia, to pursue policies that improve the economic and social wellbeing of our people, contribute to economic, environment and social development outcomes and promote information exchange and cooperation on technologies that are cost effective, efficient, economically sound, environmentally responsible and socially acceptable. It has a strong focus on two important concepts enshrined in the Principles, particularly sustainability and exchange between member economies. This project was designed to contribute to capacity building activities planned for 2016 under the Mining Task Force Proposed Workplan task on "reducing mercury use in artisanal and small-scale gold mining."

With the dissolution of the Mining Task Force, the secretariat's management of this project was transferred to the SOM Steering Committee on ECOTECH (SCE).

[1] These economies are: Indonesia, the Philippines, China, Papua New Guinea, Chile, Peru and Viet Nam

[2] Includes direct funding and expected co-financing.

II. Project Overview

The project *Developing Training Materials to Promote the Reduction of Mercury Use in Artisanal and Small-scale Gold Mining* (MTF 01 2016A) was initiated on 16 December 2016 with the Artisanal Gold Council contracted to carry out the project activities.

Overall, the project sought to produce a business training module based on leading global practice in ASGM capacity development and designed to promote Minamata Convention compliance.

Project Outputs

The project had four outputs as follows:

1. Survey existing and accessible curricula and training modules for stakeholders within the ASGM sector, focusing on training that supports efforts to eliminate mercury use.
2. Develop a training module for business planning to increase capacity of the ASGM sector, including curricula and training materials.
3. Coordinate with other activities and projects to field test the effectiveness of the training and measure results in four economies (Peru, Papua New Guinea, the Philippines, and Indonesia)
4. Present results at a workshop and prepare a report on the outcomes of the project for publication including a summary of project activities and findings, and any recommendations for future work.

Collaboration and Partnerships

In order to improve the quality of the project's outputs, maximize opportunities for the sustainability of project impacts, and deliver activities across four member economies, the contractor engaged with several organizations, institutions and individuals throughout the project. The following is a list of collaborators and a description of how they were involved in project activities.

Project Oversight

The Project Steering Committee included representation from the following organizations: National Center for APEC, Canadian International Resource Development Institute (Canada), Carlton University Institute for African Studies (Canada), Sociedad Nacional de Minería (Chile), Natural Resource Defence Council (USA), and United States Department of State (USA).

Training Delivery and Assessment

For the business training delivery and assessment in the four economies, the AGC worked closely with domestic counterparts to identify pilot training groups and ensure training materials were properly contextualized. These domestic counterparts were trained as trainers, thereby increasing the capacity to deliver the business training in the economy upon project completion. The following organizations helped to deliver business training in part or in full as domestic counterparts:

Economy	Domestic Counterpart
Papua New Guinea	Sustainable Alluvial Mining Services (SAMS)
Indonesia	Alliance of Indigenous Peoples of Indonesia (AMAN)
The Philippines	BAN Toxics
Peru	The Colorado School of Mines The Alliance for Responsible Mining (ARM)

Table 1: Domestic counterparts in ASGM business training

Finally, artisanal and small-scale miners from the following communities collaborated through participation in pilot trainings and assessments of the training programs:

Economy	Mining Community
Papua New Guinea	Esa'ala district
Indonesia	Tobongon & Tatelu (North Sulawesi) Perenggean & Beringin (Central Kalimantan)
The Philippines	Camarinas Norte (Bicol)
Peru	Ananea (Puno)

Table 2: Mining communities involved in ASGM business training

Project Timeline

This project was originally scheduled for completion in December 2017. The project was extended in order to allow for the final workshop to occur on the margins of APEC 2019, with an amended completion date of 30 November 2019.

The timeline of major project activities is outlined in Table 3.

Activities	Completion date
1. Survey instrument developed	10 February 2017
2. Report on survey results and gap analysis	21 November 2017
3. Business training module drafted	1 February 2018
4. Training modules field tested	
a. Papua New Guinea	17 August 2018
b. Philippines	16 July 2018
c. Indonesia	20 February 2018
d. Peru	14 January 2019
5. Business training module finalized	7 June 2019
6. Initial results presented at APEC 2018	20 August 2018
7. Final results presented at APEC 2019	6 August 2019

Table 3: Timeline of major project activities

III. Project Outputs

1 – Survey of Curricula and Training Materials

Survey Objectives

The survey was designed to collect data to inform stakeholders, including domestic and local governments, development agencies, NGOs, service providers, vocational training centers, large scale mines and small-scale mining organizations, regarding what kinds of training materials have already been developed for the ASGM sector.

Overall the survey had five objectives:

1. Identify who has developed educational tools targeted at miners[3] in the ASGM sector
2. Identify what topics these tools address
3. Determine the suitability of these tools for various kinds of training approaches and various kinds of ASGM miner populations
4. Determine the accessibility of these tools to ASGM miners and organizations that work with ASGM miners
5. Describe some of the gaps in educational tools developed for ASGM miners, with a focus on business training tools

Survey Methods

The survey was designed by the contractor with input from the project steering committee. It was designed to maximize response rate by keeping the number of questions low (less than 20),and emphasizing multiple-choice/checkbox answer formats with optional open-ended answers. For ease of access and collection of data for processing, it was administered using Google Forms, a web-based interface.

Survey participants were identified based on their known involvement in artisanal and small-scale mining (ASM) initiatives and were selected to represent a broad geographic and linguistic distribution of ASM actors. It should be noted that survey outreach extended in some cases to organizations that have worked outside of the artisanal gold sector (for example in the artisanal gemstone, cobalt or 3T sectors) in recognition that some of the training materials developed for miners in those sectors would be directly transferable to miners operating in the ASGM sector.

The survey link and background information on the project was distributed by email to 90 people at 67 organizations/institutions. Annex 2 contains the complete list of organizations contacted by the survey. Approximately five weeks following the initial email a reminder email was sent to those who had not yet responded. The survey link was left open to receive responses for 14 weeks in total.

[3] In the case of this project *ASGM miners* refers to those involved in the production and point of sale for gold produced in artisanal and small-scale operations. This includes miners, haulers, crushers, processors and site managers/bosses.

In the case of organizations who had identified the development of business training tools, the contractor attempted to contact these organizations directly to obtain more information on these tools and, if possible to gain access to the tools, in order to inform a gap analysis of business training materials.

The survey in its entirety can be found in Annex 1: Survey Questions.

Limitations

There are many limitations to the conclusions that can be drawn from the information gathered through survey responses. Some limitations have to do with reach of the survey and others have to do with the depth of information that can be collected using this methodology.

First, the ability of the contractor and the project steering committee to identify and contact the entire set of organizations, institutions and individuals that have developed training materials for the sector was necessarily imperfect. In an attempt to reach as many of these organizations and institutions as possible, measures were taken to contact a wide array of individuals who have a known history of work in the ASGM sector; however, it is probable that many potentially relevant respondents were not known to the contractor and the steering committee and therefore were never contacted. Any materials developed by these non-contacted organizations will not be captured in this report. In particular the many organizations operating with a limited profile in economies and for which English, French or Spanish (the languages of the survey) are not a lingua franca may be underrepresented.

A second limitation is response rate. Although, at 37 percent, this survey received a high response rate[4], it nonetheless means that the majority of organizations/institutions contacted did not share any information. In fact several organizations that are known to have developed high quality training curricula and materials did not respond to the survey. Amongst those that are known to provide quality training services on a variety of issues, but who are not captured in this report include: Alliance for Responsible Mining/Fairmined, The Geological Survey of Denmark and Greenland and The Mining Qualifications Authority of South Africa

A third limitation involves the depth of information which can be captured by a survey. A tool with set form answers is more suitable for a scanning exercise than an in-depth analysis as would be required for a comprehensive training tool gap analysis. Details about the training materials reported are therefore limited. This means that in most cases information such as the context of the development of the training materials, the modality of training delivery, prior knowledge requirements on the part of trainees and a detailed list of topics covered were not captured by the survey.

Survey Results

Who has developed training materials for ASGM?

A total number of 68 organizations or individuals were contacted across 6 APEC economies and 18 non-APEC economies. Twenty-five of them provided responses to the survey, giving a 37% response rate.

[4] Externally administered surveys such as this one commonly receive a response rate between 10 and 20 percent.

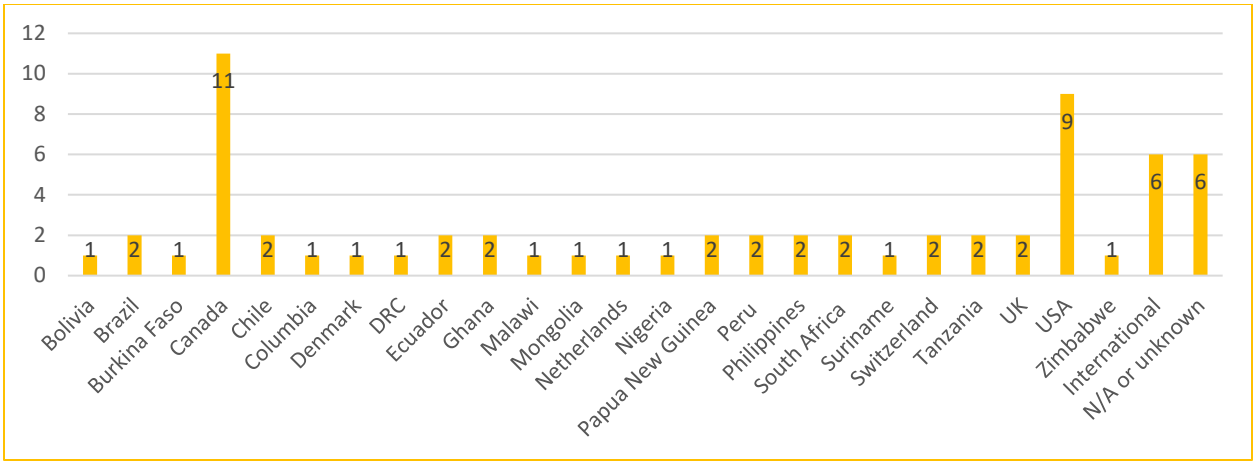

Figure 1: Number of organizations contacted by economy or location

Of the 25 respondents, 23 self-identified as having developed training materials that may include presentations, booklets, flip charts, online tools, websites, curricula, handouts, videos or other formats intended to educate or build knowledge and capacity of miners. These organizations are identified in Table 4.

ORGANIZATION	TOPICS COVERED
AGENDA for Environment and Responsible Development (Tanzania)	Health & Safety Mercury Reduction Environmental Management
Artisanal Gold Council (Canada)	Health & Safety Gender Mercury Reduction ASGM Site Inventories
Centro de Tecnologia Mineral (Brazil)	Mercury Reduction Business Training Environmental Management
Cumbre del Sajama (Bolivia)	Health & Safety Gender Mercury Reduction Business Skills Environmental Management Prospecting/Exploration Community relationships
Estelle Levin Ltd. (UK)	Health & Safety Gender Mercury Reduction Environmental Management Prospecting/Exploration Extracting, Crushing, grinding, sieving, using sluice boxes
International Council on Mining and Metals (International)	Guide to engagement between ASM and LSM

Instituto Nacional de Investigation Goelogico Minero Metalurgico (Chile)	Health & Safety Gender Mercury Reduction Environmental Management Prospecting/Exploration Optimization of the mining cycle and metallurgy.
Ministry of Health (Indonesia)	Health & Safety
Ministry of Mines and Steel Development – Nigeria (Nigeria)	Formalization Monitoring Regulatory Coordination
Mintek (South Africa)	Health & Safety Mercury Reduction Business Skills Environmental Management
Prospecters and Developers Association of Canada (Canada)	Prospecting/Exploration Community Engagement
Pure Earth (formerly Blacksmith Institute) (USA)	Health & Safety Gender Mercury Reduction Environmental Management
SAM Mongolia project (Mongolia)	Health & Safety Gender Mercury Reduction Business Skills Environmental Management Human Rights Mining Organisation and Community Building
Small Scale Mining Training Centre-Papua New Guinea (New Guinea)	Health & Safety Gender Mercury Reduction Business Skills Environmental Management Prospecting/Exploration Mining & Processing Basic Geology & Gold Mine Legislation Personal Development HIV/AIDS
Sociedad Nacional de Minería - Fundación Tecnológica (Peru)	Health & Safety Prospecting/Exploration
Solidaridad (Netherlands)	Health & Safety Gender Mercury Reduction Environmental Management

Stakeholders Engagement for Sustainable Development	Gender Mercury Reduction Environmental Management
Sustainable Alluvial Mining Services (Papua New Guinea)	Environmental Management
U.S. Geological Survey (USA)	Environmental Management Prospecting/Exploration Mapping and monitoring
UN Environment (International)	Mercury Reduction Environmental Management
University of British Columbia – NBK Mining (Canada)	Health & Safety Mercury Reduction Environmental Management Technical solutions
Yayasan Tambuhak Sinta (Indonesia)	Mercury Reduction Business Skills

Table 4: Organizations responding to the survey that have developed training material for ASM

The survey asked respondents to identify other organizations and institutions that, to the best of their knowledge, had developed training materials for artisanal and small-scale gold miners. Many of the organizations identified by survey respondents were organizations that had already been contacted by the contractor to participate in the survey. This provides a degree of confidence that most major organizations that provide training services or materials to small scale miners had been included in the survey. Nevertheless, there were some organizations identified which had not been contacted by the survey.

In addition to these organizations, there were several organizations that the contractor had previously known to have developed training materials, but who did not provide a response to the survey. Therefore, two potentially important sets of organizations, who did not participate in the survey but who have worked on training tools, are not represented in these survey results: (a) those identified by survey respondents and (b) those identified by the contractor. The complete list of these organizations can be found in Table 5.

ORGANIZATION
Alerta Minero (Peru)
Alliance for Responsible Mining (Colombia)
ARCOM
BaliFokus (Indonesia)
BT (formerly BAN Toxics) (Philippines)
Empresa Nacional de Minera (Chile)
Fairmined (Colombia)
Fairtrade Gold (International)
Federation of Miners Association of Tanzania (FEMATA) (Tanzania)
Geological Survey of Denmark and Greenland (Denmark)
Mining Qualifications Authority (South Africa)
Nigerian Institute for Mining and Geosciences (Nigeria)
Pact (International)

Red Social (Peru)
Secretary for Economic and Mining Development of Mato Grosso State (Brazil)
SEF Canada (Canada)
Sernageomin (Ministerio de Mineria) (Chile)

Table 5: Organizations that did not respond to the survey who have been identified by survey respondents or who are otherwise known as having developed training materials for ASM

The organizations that responded affirmatively to having developed training materials for ASM miners primarily self identified as NGOs or not for profits (44%) with the remainder representing government institutions (30%), independent service providers (13%) or "other" (13%) (Figure 2). This leaves a considerable gap in responses from organizations representing the large-scale mining sector including mining companies and industry associations, as well as for-profit providers of development and mining corporate social responsibility (CSR) assistance. These groups should be targeted in future research.

What Kinds of Training Materials Have Been Developed?

Topics

Six options were provided to survey respondents when describing the topic of their training materials: health & safety; gender; mercury reduction; business skills; environmental management, and; prospecting/exploration. Of these six topics, health and safety (16), mercury reduction (16) and environmental management (16) proved to be the most common training themes, with gender (9), prospecting and exploration (8) and business skills (6) less commonly identified.

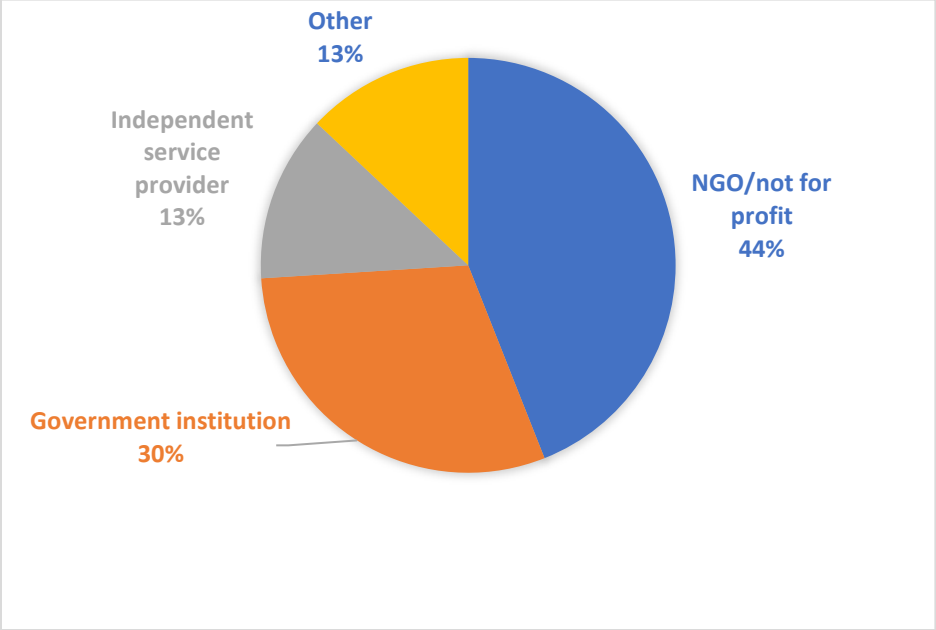

Figure 2: Developers of training material by type of institution

Respondents were asked to specify 'other' topics for which they have developed training materials. The following are the 'other' topics identified by respondents:

- ASGM inventories
- Community relationship building
- Miner engagement
- Formalization and regulations
- Human rights
- HIV/AIDS

- Mapping
- Mineral processing/metallurgy

Twenty-three of the respondent organizations reported planning to develop other training materials for artisanal and small-scale miners in the coming 24 months. For the most part, these planned materials cover the same topics that are addressed by existing materials reported in this survey. The most popular topics for planned training materials include: health and safety (13), mercury reduction (13), environmental management (12), gender (10) and business skills (10).

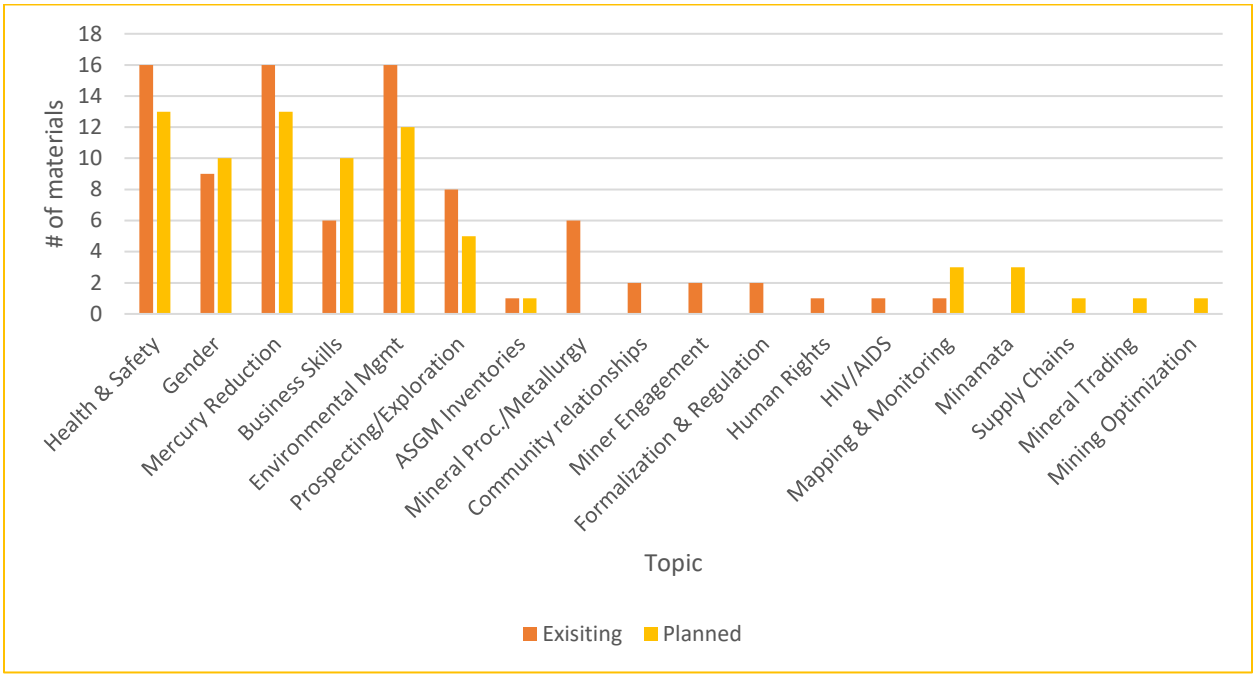

Figure 2: Existing and planned training material by topic

Two trends stand out from the data collection: (1) Many training topics appear to be covered extensively by a number of organizations working across a number of economies and; (2) The planned development of new training materials correlates closely with the existing training topics already most represented in the survey results.

From these data, one may conclude that organizations who have developed training material may not be aware of the existence of previously developed materials by other organizations and institutions. This appears to be, at least in part, the case as was evidenced by the brevity of responses to the survey question: "Are you aware of any other institutions or organizations who have developed educational tools or conducted trainings for the ASGM sector?" This would be an indicator of poor coordination between institutions working to improve the ASGM sector world-wide.

Alternatively, organizations who are developing new training materials may be aware of similar materials that already exist, but they may not consider them to be contextually appropriate for the specific target audience they are working with. This implies that even if there was a high degree of awareness and sharing of resources between institutions developing training materials, adapting existing tools and developing more appropriate materials would still be required.

Finally, while certain topics are supported by a wealth of training materials (e.g.: by the year 2020, there may be 29 different materials to support training on health and safety issues for ASGM miners), the organizations offering training may be developing materials on very specific and focused topics. However, due to the response choices offered to survey respondents, these may have been aggregated in this survey under broader themes. For example, two organizations may have developed training curricula for "health and safety" but one may be offering training in first aid, while the other may be offering training in the prevention of sexually transmitted infections.

Improved production processes	Health and Safety	Social issues
• **Efficient and effective technologies for water use** • **Alternative use of borax for gold amalgamation** • **Optimization of mining processes** • **Alternative models of gold amalgamation** • **Mercury free technologies and techniques**	• Assessing mercury disease for health workers in the community • First aid for mercury intoxication for miners or health workers	• Conflict resolution in ASGM • Gender in ASGM • Children in ASGM
Environmental management	**Markets & value chains**	**Policy, legislation & formalization**
• **Site rehabilitation and revegetation** • **Strategic environmental assessment of the ASGM sector for governments** • **Sustainable development in ASGM**	• Minerals beneficiation and value addition • How to build demand for mercury-free gold • Attracting private sector investment to ASGM operations • Partnership development with mining companies and other stakeholders	• Mining regulation and policy • Economy specific formalization training (steps to become formal) • Formalization best practices • Organizing for miners (union forming, advocating) • Legal issues and framework for ASGM sector

Table 6: Topics that survey respondents expressed interest in for future training materials

Audience

Limited information was provided by survey participants on the nature of the training materials developed. Participants were asked about the target audience for their training materials, in order to disaggregate materials intended to build the capacity of ASGM miners from those targeted at other ASGM stakeholders such as regulators. Where the respondent specified the intended audience for their training materials, 53% of all existing training tools were intended for "artisanal or small-scale miners or processors and their families". The audience group targeted with the second-highest number of tools were "government officials", with 30% of the existing tools directed at them.

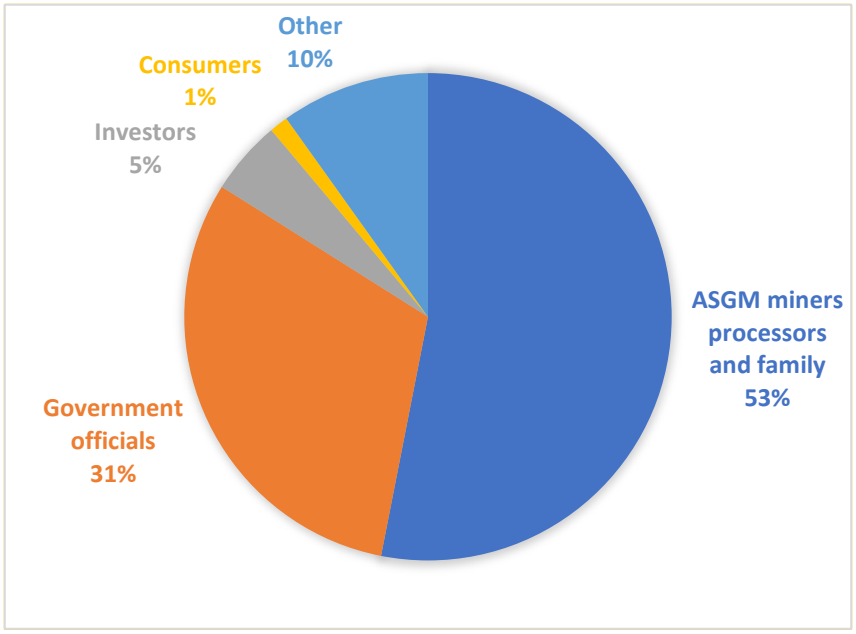

Figure 4: Intended audience for existing training materials

How Accessible are the Materials?

Language

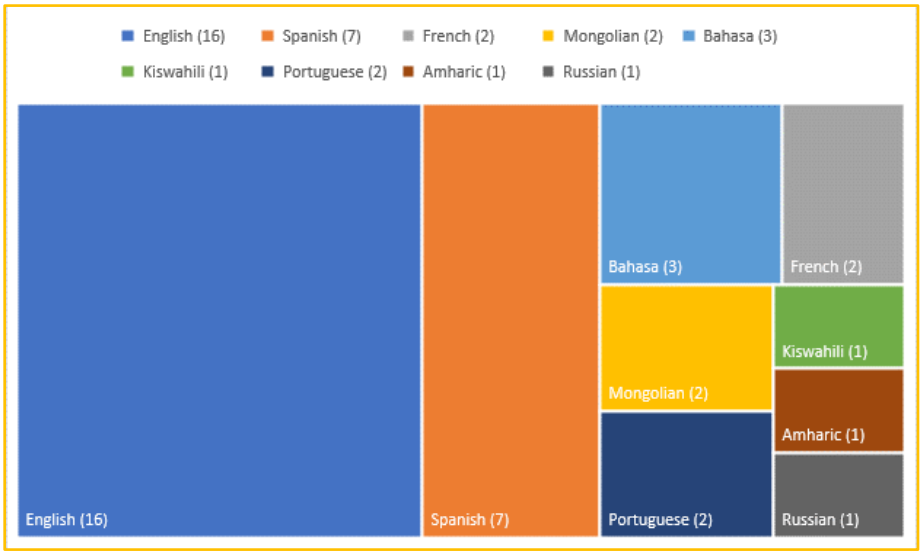

Figure 3: Training materials by language

The survey was primarily distributed in English, however Spanish and French translations of the survey were distributed to participants who were identified as working primarily in those languages. It is therefore not surprising that the majority of respondents specified that their organizations offer training tools in English (16), as well as in decreasing order: Spanish (7), Bahasa Indonesian (3), Mongolian (2), French (2), Portuguese (2), Amharic (1), Kiswahili (1), and Russian (1). Ten organizations indicated that their training tools are available in more than one language. It is notable that although

French is spoken in many non-APEC economies where ASGM Is extensively practiced, there is a significant gap in reported French language training tools available to miners.

Access

Organizations that have developed training materials have myriad valid reasons for controlling access to them which include amongst other things: revenues derived from training, recognition of intellectual property and insuring against misuse of knowledge products. Despite these legitimate concerns, restricting access has the effect of limiting the number of stakeholders reached and, ultimately limiting the potential of the sector to begin operating within the formal economy. Furthermore, it results in multiple organizations investing time and using limited development resources in "reinventing the wheel". It is therefore important to evaluate the accessibility of current training materials, as well as barriers to access.

Of the 23 organizations who reported having existing tools, 11 reported that their materials were freely available without barriers to access, 10 reported that their materials were freely available "with conditions", and 2 reported that their materials were proprietary and could not be shared. Where specified, conditions for using the materials included requirements to first consult the organization to ensure relevance and alignment with their mission, use of the tools under project agreements, or on the basis of service provision for fee. It appears that freely shared training materials tend to be content-driven tools such as hand outs, websites and videos, whereby materials with conditional access tend to be process-driven such as presentations and curricula.

Where existing training materials were specified for the audience of the artisanal miner or processer, the vast majority of these tools were printed material (i.e. brochures, booklets, handouts) with a few presentation materials (i.e. training modules, slides, videos). Unique responses included retort designs, an android app and a height chart with stickers. If there is an opportunity for further follow-up, it could be helpful to assess each tool for suitability to different training contexts (e.g.: is the tool suitable for miners with extreme low literacy, can it be delivered at a mine site without a classroom, can it be accessed without a reliable internet connection, can it be adapted to audiences with varying levels of education, technical knowledge, etc.).

Analysis and Recommendations for Module Development

GAP Analysis for Business Training Materials

This section focuses on those organizations that have developed training materials aimed at building business skills and capacity amongst artisanal and small-scale miners. These materials are described and where possible an analysis of content is provided. Finally, this section discusses how the results and analysis of the survey responses were used to inform the development of a training curriculum to be under the auspices of this project. As previously indicated in this report, the conclusions that can be drawn from these survey results are limited by the nature of the methodology chosen and the constraints of the scope of work.

Who Has Developed Business Training Materials for ASM?

The following organizations have been identified through the survey or through prior knowledge as having developed business training materials for ASM.

ORGANIZATION	LANGUAGE OF MATERIALS	SURVEY RESPONDENT?
CETEM - Center for Mineral Technology (Brazil)	Portuguese	Yes
Cumbre del Sajama (Bolivia)	Spanish	Yes
GEUS - Geological Survey of Denmark and Greenland (Denmark)	English	No
Mintek (South Africa)	English; Other?	Yes
Pact	Unknown	No
SDC Mongolia (Mongolia)	Mongolian	Yes
SEF Canada (Canada)	Spanish	No
Small-scale Mining Training Center PNG (Papua New Guinea)	Unknown	Yes
Solidaridad	Unknown	Yes
Tetra Tech (International)	Unknown	No
Yayasan Tambuhak Sinta (Indonesia)	Bahasa Indonesian	Yes

Table 7: Organizations who have developed business training materials for ASM

Although the survey helped to identify organizations that had developed business training tools, it did not assess the intended learning outcomes for these tools, the specific topics covered in the trainings, nor the level of prior education/previous knowledge required for participants. Although all seven organizations with existing business skills training tools who responded to the survey indicated that they would be willing to share their materials, only four responded to our requests for follow-up. Of these, only the Swiss Agency for Development & Cooperation made their Sustainable Artisanal Mining Project (Mongolia) materials fully available.

Training Gaps

Although very few training materials were shared with the contractor for in-depth review, it appears that a number of ASM specific, and potentially high-quality business and entrepreneurship curricula exist. In particular the curricula developed by Mintek and the Small-scale Mining Training Center in Wau, appear to set the benchmark in terms of programs designed with clear and ambitious learning outcomes in mind, customized for a small-scale mining audience and supported by high quality trainers and institutional resources.

However, a review of the materials already developed reveals several gaps that prevent these materials from being utilized to help professionalize the ASGM sector on a large scale. Primarily, there is the issue of access. With the exception of the SDC, all organizations contacted restricted access their materials. This position is, in some cases, the result of a feeling that these materials represent organizational knowledge products underpinned by an intellectual and financial investment that most organizations wish to protect. In several cases training was provided on a fee basis and therefore the materials represented an intellectual property business asset that required protection.

Secondly, many materials appear to be highly specific to the particular business, legal and institutional context in which they were intended to be delivered. This is an approach that makes sense since ASGM

operations globally operate under different legal and regulatory structures; sell their product through different informal, grey and formal market value chains; are immensely varied in terms of technological and operational processes; and are made up of populations with significant cultural and educational specificities that need to be considered when teaching or practicing business skills.

Thirdly, although some materials seem to be flexible enough to be delivered in a variety of educational settings, many of the materials appear to be designed to be delivered in an institutional setting. This requires miners to be able to travel to the training location rather than vice versa. This represents a significant barrier for an industry whose business people are overwhelmingly the rural poor working in remote settings and for whom the costs of travel represent a barrier to investment in education.

Integrating Survey results into the Design of an APEC Sponsored Business Curriculum

The business curriculum that the contractor worked to develop as part of this project is shaped both by the gaps identified in the analysis of currently available business training materials and the constraints on curriculum design of the terms of this project.

- The training materials were structured as a full curriculum with learning outcomes, instruction methods, teacher and student materials and assessment materials developed.
- The curriculum is open access; available for use, in part or in full, without cost or other use barriers and with adaptations and customization to the materials encouraged. This enables the greatest impact in terms of the number of ASGM miners that can be reached.
- The curriculum including didactic materials, teaching aids and exercises is designed to be transportable to mining sites with minimal reliance on technological inputs.
- The curriculum is directed at a global miner audience. In practice, this means materials are: targeted at those with a basic level of literacy and numeracy and with little to no knowledge of computer use; and designed to deliver basic entrepreneurial learning outcomes. More advanced learning outcomes would require as a prerequisite, for example, greater numeracy skills, familiarity with business vocabulary, understanding of basic microeconomic concepts and familiarity with the use of personal computers. This would thus exclude the majority of ASGM miners. Therefore, the recommended approach was to bring those with the lowest skill and knowledge level up to a higher common standard.
- The curriculum is designed as a foundation on which further and more contextually specific business skill gaps can be identified and addressed. The curriculum thus includes a component aimed at not just teaching basic business competencies but also identifying other business skill needs around which future capacity building resources can be mobilized.
- The curriculum is limited to a two-day training as defined by the terms of the project.
- Many ASGM miners, in particular women, run households which are in essence small-businesses with revenue/expenses to manage and decisions about saving vs investment to make. Strengthening the ability of miners to make sound financial decisions, not just within their ASGM operations, but within their households and other economic sectors in which they are active, is an important part of delivering lasting economic benefits to ASGM miners. The curriculum thus also includes basic household budgeting and accounting in its design.

2 – Development of a Business Training Module

Training Module Objectives

The objective for this project output was to develop a business training module that addresses the fundamentals of small business management in the ASGM sector, thereby increasing the overall capacity of the sector. The output was a complete curriculum including teaching materials, student materials, guidelines for instructors, evaluation materials, and additional learning resources. The curriculum is customizable in order to be adaptable to a range of geographical, cultural and educational circumstances, and under consideration of local realities.

Based on the recommendations developed in the previous activity, the curriculum was designed as an introductory level course on basic knowledge, skills and attitudes that will enable artisanal and small-scale miners to run more sustainable, responsible, and profitable enterprises. Key knowledge outcomes include financial literacy. Skills outcomes are hard and soft entrepreneurial skills such as budgeting and accounting. Attitudinal training focuses on seeing ASGM enterprises as responsible community actors.

The learning outcomes for the curriculum are as follows:

1. Understand basic business terminology
2. Articulate how small ASGM businesses are organized
3. Understand some of the common reasons that a small business thrives or fails
4. Understand how business decisions affect worker health, safety and the environment
5. Understand potential sources of financing for a small-scale mining enterprise and strategies to attract investment
6. Demonstrate the ability to construct both a personal and a small business budget
7. Demonstrate basic accounting skills
8. Demonstrate the ability to construct a basic business plan

Training Module Development

The business training module was developed to provide miners and community members with basic financial literacy as well as the basic skills needed to build and carry-out a modest business plan. These skills are essential to building a sector that is better organized, ready to formalize and where increased profits can be reinvested in improved operations and community development.

The module was designed to be delivered in two, eight-hour training sessions. The following topics are covered in the course: Course Introduction and Skills Assessment; Basic Business Terminology and Company Organization; Profit, Revenue, and Supply; Health, Safety, and Environment; Basic Budgeting; and Basic Financial Accounting. See Annex 5 for the general training agenda that is included in the module.

The course material was developed such that it would be relevant to an audience with a low literacy/numeracy level as this is a common aspect of communities involved in artisanal mining. The course was designed to be presented with minimal to no digital technological aides and provides many opportunities for group work to account for the expected unevenness in prior knowledge, skills and learning readiness of participants. See Annex 6 for the complete curriculum.

3 - Field Testing Training Modules

Between February and August 2018, field testing of the training module took place in four economies: Peru, Papua New Guinea, Philippines, and Indonesia. The objectives of the field testing were four-fold:

1. To train domestic trainers on the delivery of the course thereby developing domestic capacity to conduct business training for miners upon project completion
2. To obtain feedback from miners and compare the actual learning outcomes for miners against the intended learning outcomes
3. To identify strengths and weaknesses in the training modality in collaboration with domestic trainers
4. To fine-tune the training module based on the results of the above.

Economy 1: Indonesia

The curriculum was adapted to the Indonesian context between 22 January and 4 February 2018 with the help of the contractor's Indonesia staff as well as domestic supporting partner Aliansi Masyarakat Adat Nusantara (Alliance of Indigenous Peoples of Indonesia – AMAN for its Bahasa acronym).

Training Schedule and structure

The curriculum was delivered from 6 to 20 February 2018 in four communities as follows:

Location	Group Number	Date	Number of trainees
Tatelu, North Sulawesi	Tat 1	6 February 2018	45 Male: 14 Female: 31
	Tat 2	7 February 2018	30 Male: 23 Female: 7
Tobongon, North Sulawesi	Tob 1	1 February 2018	33 Male:6 Female:27
	Tob 2	3 February 2018	43 Male: 15 Female: 28
Beringin, Central Kalimantan	Ber 1	15 February 2018	31 Male: 21 Female: 10
	Ber 2	16 February 2018	31 Male: 22 Female: 9
Perenggean, Central Kalimantan	Per 1	20 February 2018	30 Male:14 Female 16
Total:			243 Male: 115 Female: 128

In each community except Parenggean, two groups of trainees were organized consisting of between 30 and 45 students at a time. This allowed for seven separate repetitions of the training.

Advice from the contractor's Indonesia staff and local partners AMAN was that the course should be condensed into four hours. This was both to accommodate the learning needs of the miners who were unaccustomed to spending an 8-hour day in a classroom, as well as to minimize lost productivity and income for miners which can be a significant disincentive for miners to participate in this type of training. As a result, the curriculum was reorganized so that different components of the curriculum could be piloted in different communities. The curriculum was divided into two versions, each with the same basic level of business instruction consisting of:

- Basic business concepts (profit, revenue, expenses);
- Overview of funding, financing and formalization;
- Environmental health and safety

And each also incorporating one of the following elements:

- Budget preparation
- Financial accounting
- Group business plan development

Due to time constraints, the following elements of the complete curriculum were not taught during the pilot trainings:

- Principles of supply, demand, pricing and profit optimization
- Loan interest and repayment; and
- Funding and financing.

At Tobongon, Beringin, and Parenggean the development of a business plan for a hypothetical business was conducted. In the full two-day programme, the business plan is incorporated into every module, including financial accounting and budgeting; however these components were omitted for the shortened 4-hour schedule at these locations. Previous baseline work conducted by the contractor at Tatelu suggested that the location maintained higher levels of education and literacy. As such, two different training schedules were delivered at Tatelu to test the remaining components of the full course. One day omitted the business plan development project and included an intensive budget preparation exercise, while the other day included an intensive financial accounting exercise.

Training Delivery and Language

Training was led by Bryan Koehler, the contractor's Program and Environmental Manager, with translation into the Indonesian language (Bahasa), by one of two contractor's Indonesia staff. Languages in Indonesia vary greatly between regions, and in some cases, even between adjacent cities. To accommodate this, AMAN was present to assist in translations to local languages at Tatelu and Tobongon. No local partner was available at Parenggean or Beringin.

Since the training of a trainer (capacity building) was a key part of piloting the materials, AMAN was involved in the delivery of the curriculum in an iterative manner. The contractor's trainer delivered the

complete training to the first group, and AMAN was progressively involved in more of the training with subsequent groups, finally providing the majority of the material delivery to group Tat2.

Training effectiveness evaluation

Prior to and following training, the class was given an evaluation of basic business concept knowledge. This test was a simple, multiple choice questionnaire asking them about their background, basic understanding of business principles, and expected learning outcomes from the course. The results of this initial test were used by the instructor to adjust course materials and delivery methods to accommodate the education levels present in the class. At the end of the course, participants were also given questionnaires with more specific questions about course effectiveness, the uptake of intended learning outcomes, and areas for course improvement.

Economy 2: Philippines

The curriculum was delivered in the Philippines as follows:

Location	Date	Number of trainees
Camarines Norte, Philippines	15 and 16 July 2018	51 Male: 29 Female: 22

The course was delivered almost in its entirety to the same group over a period of two days. However, the daily maximum training time was limited to between 4 and 5 hours to accommodate the learning needs of the students. As a result, several aspects of the curriculum were omitted or reduced to ensure that the most important materials were taught to the class.

The curriculum presented to the community at the Philippines training location omitted the following topics due to time constraints and learning goals of the students:

- Overview of funding, financing and formalization;
- Financial accounting for small businesses.

A major component of the training included a project which detailed the development of a business plan for a small business. This “course project” was incorporated into every module, including budgeting; however, the budgeting component and financial accounting component of the course project was omitted due to time constraints and student capabilities. The financial accounting module was omitted entirely from this training instance for the same reasons.

Training Delivery and Language

Training was led by Bryan Koehler, the contractor's Program and Environmental Manager, and was Training was conducted in a mixture of English and Tagalog.

BAN Toxics was involved in presenting and assisting in the completion of various examples and problems used in the classroom. In addition, BAN Toxics presented the budgeting workshop in its entirety, encompassing the entire session on the second day of training.

Training effectiveness evaluation

Prior to training the class was given an evaluation of basic business concept knowledge used by the instructor to adjust course materials and delivery methods to accommodate the education levels present in the class. At the end of the course, participants were also given questionnaires with more specific questions about course effectiveness, the uptake of intended learning outcomes, and areas for course improvement.

Economy 3: Papua New Guinea

The curriculum was delivered in Papua New Guinea as follows:

Location	Date	Number of trainees
Esa'Ala, Milne Bay Province, Papua New Guinea	16 and 17 August 2018	46 Male: 30 Female: 16

The course was delivered almost in its entirety to the same group over a period of two days. However, the daily maximum training time was limited to between 4 and 5 hours. The overview of funding, financing and formalization was omitted from this training.
As in other locations the "course project" was incorporated into every module but the course project components for budgeting and accounting were omitted. The training material was left with to the local partner, Sustainable Alluvial Mining Services (SAMS) such that they could continue the training in its entirety if the students requested it.

Training Delivery and Language

Training was led by Bryan Koehler, the contractor's Program and Environmental Manager and was performed in English as it is the primary language of Papua New Guinea. The local partner Sustainable Alluvial Mining Services presented more complicated modules, including the financial accounting module, as students sometimes found it difficult to understand the Canadian accent and having the local partner present complicated concepts ensured better understanding.

SAMS was involved in presenting and assisting in the completion of various examples and problems used in the classroom. In addition, SAMS presented the financial accounting workshop in its entirety, encompassing half the second day of training. The budgeting workshop was presented by the contractor at this location.

Training effectiveness evaluation

As elsewhere, the prior and post training questionnaires were given to the participants.

Economy 4: Peru

For the training delivery and assessment in Peru, the contractor partnered with the Colorado School of Mines (USA), the Alliance for Responsible Mining and their project Ananea in the delivery of the business curriculum.

Training the trainer

A training the trainer session was conducted with Mr. Gerardo Martinez of the Colorado School of Mines as follows:

Location	Date	Number of trainees
AGC HQ, Victoria, Canada	19 November 2018	1 Male: 1 Female: 0

Mr. Martinez met the contractor's staff (MM. Koehler and Rosenbluth) at the contractor's headquarters. Mr. Martinez and the contractor staff their respective projects' contexts and discussed challenges and adaptation needed to best deliver the material in Peru. Primary adaptations needed were translating the material into Spanish and an increased focus on the business planning exercise in order to meet CSM project objectives to develop a business plan for a bateadora jewelry manufacturing enterprise.

Training delivery and language

The training in Ananea was conducted over two days and led by two separate trainers as follows:

Location	Date	Number of trainees	Trainer
Ananea, Puno Region, Peru	10 December 2018	15 Male: 0 Female: 15	Mr. Gerardo Martinez (CSM)
Ananea, Puno Region, Peru	14 January 2019	15 Male: 0 Female: 15	Mr. Hugo Escobar (ARM)

The training was broken into two sessions due to limitations on the available training times for the bateadoras, and a desire to test curriculum modules on the target audience before determining if subsequent modules would need to be adapted according to participant feedback. All training was conducted in Spanish by the trainers.

The initial training was led by Gerardo Martinez, of the CSM. The bateadoras, due to personal and mine site commitments, had 3 hours for the first training session which was conducted in a project meeting space on the mining site. Modules 1-3 of the Spanish training were delivered (introduction to business concepts). The remaining modules were delivered by ARM project coordinator, Hugo Escobar over a complete day at the mine site. Extra attention was paid to modules 6 and 7 (budgeting and accounting respectively) as these were topics identified as being particularly relevant to the bateadoras.

ARM intends to further develop the business planning exercise and continue working on a group business plan with the aim of developing a document that will be used to acquire a loan for jewelry making equipment and materials.

Training effectiveness evaluation

A pre-training evaluation was given to participants at the 14 January 2019 session, however no post-training evaluation was conducted by the domestic partner. Trainee feedback is thus anecdotal. ARM also reports that there is significant interest from the bateadoras in: (1) further enhancing their skills for managing a small enterprise, (2) developing more complex business plans, (3) gaining experience specific to the management of cooperative business structures.

Finally ARM reports that finding discrete blocks of time to train the bateadoras is a challenge due in part to their regular mine site work commitments as well as other commitments such as family responsibilities. This reflects the contractor's experience delivering pilot trainings in Indonesia, the Philippines and Papua New Guinea.

Results and Lessons Learned

Planning to present the material over two consecutive eight-hour sessions proved problematic to coordinate with the miners and the other community members. The best path forward is to have the material ready to deliver in such a fashion, however, the material should be adjusted to accommodate reductions in course delivery time or be able to accommodate being presented over several shorter sessions and in evenings following workdays.

It was noted in several of the economies that there was lower attendance on the second day of training as compared to the first, notably with the attendees on the second day being majority female. This is due to the fact that the men had to go back to work and could not afford to take two days off of work in a row. This highlights the importance of splitting the training into sessions which can be completed after work in smaller groups to accommodate working schedules.

In one economy, the issue of high demand for the training and therefore unregistered participants joining required sharing the course materials and some students not having a desk to work on. In future training sessions it is recommended that a firm limit on the number of students be enforced so as to ensure those that signed up in advance receive sufficient training and materials.

The instruction of basic business principles included a discussion of foundational business terminology and processes, followed by questions to test students' understanding of these concepts. Most questions about the basic principles went either unanswered or were answered incorrectly and required further explanations. This seems to indicate that the basic terminology was a necessary component of the course even for audiences with a more sophisticated business and educational acumen.

Included in every training session was a module on health, safety, and the environment and how those topics related to successful business practices and formalization. This module was particularly well received by the students, and they showed keen interest in ways to help reduce their environmental impact and how to reduce risk in the workplace. In many cases this module lead to fruitful discussions on how to obtain business loans from lenders and financiers and helped to reinforce the importance of formalization.

It was noted that audience interaction while presenting the training material varied greatly depending on who was presenting the material. When the material was presented in English and translated into the local language, student engagement was low, and interest appeared to wane. In many cases questions went unanswered or took significant prompting on the part of the teacher. Alternatively, when the material was presented by the local partner in the local language, the students were much more engaged and enthusiastic, and students were more likely to answer questions posed to the class. This difference is attributed to cultural and didactic barriers having to do with inhibited interactions around foreigners, and the mental burden of concentrating on course material through imperfect language interpretation.

It is suggested for future delivery of the business training material that the material be presented by a local language speaker as much as possible.

Coordination through a local partner where the contractor is not present, as in the Peru training, presents certain challenges, particularly in terms of standardization of evaluation and obtaining feedback that can be reintegrated into the material design. However, it is clear that the materials can easily be understood and taught by a skilled trainer with limited business development experience, who understands the local ASM context. This was the case both for the CSM and ARM trainers who report successful and effective delivery of the training

The course material tested proved to be too easy for more developed communities with more sophisticated business profiles (eg: small mechanized mining associations or cooperatives). However, it was sufficiently challenging without over-exerting students in communities with less sophisticated mining businesses. The latter scenario is what the training materials were intended for, and the results of the course evaluations demonstrated the materials appropriateness.

The Peru training was the only example of field testing in a context where an actual for-profit enterprise was being developed by the trainees. This provided clear benefits in terms of the level of interest and participation of the trainees and also helped to shape the delivery of the training so that more time could be spent on elements practical to the specific business challenges of the target group.

Generally, student feedback conveyed in person was very positive. Several comments were provided directly to the instructor which conveyed enthusiasm and gratitude that the contractor was working with the community in an educational capacity. The general lack of training and professional development opportunities in ASGM was apparent.

Several questions on the course evaluation forms pertained to knowledge and concepts the groups would further like to explore. Amongst those commonly cited included:

- Loans and seeking investment
- Budget preparation
- Accounting skills
- Financial planning for family units
- Basic legal business structures (private sole-proprietorship company, partnership enterprise, incorporation, cooperative)

Methods for eliciting greater student feedback on the contents and delivery of the training materials need to be considered. More detailed feedback can potentially be obtained by conducting course evaluations in a focus group rather than a questionnaire format. Anxiety about providing critical feedback to the instructor could potentially be alleviated by having a local partner or even a trainee lead the focus group.

5 –Workshops on Project Results and Lessons Learned

APEC Mining Week 2018, PNG

Workshop Objectives

This workshop was an initial opportunity to present project results to representatives from APEC economies and receive feedback on key project outputs such as the business skills curriculum prior to completion. The workshop was a half-day event intended to present various miner and ASGM stakeholder

training programs and then explore opportunities for government, and LSM to better understand each other and how each can help to improve the overall gold sector through engagement with small-scale gold mining. The workshop included presentations and group activities.

Workshop Organization

Mining Week was held August 20-24 in Port Moresby, PNG. The contractor was given a half-day time slot on Monday August 20, 2019 for the workshop. The Project Overseer, the Canadian International Resource Development Institute (CIRDI) and the contractor developed an agenda in collaboration with Mining Week organizers and the Canadian/Intergovernmental Forum (IGF) Mine closure checklist project funded by the MTF. No project specific delegates were invited to this workshop due to miscommunication with the APEC Secretariat over travel approval timeline requirements.

Workshop Delivery

The workshop included a panel of speakers providing context for the project, presenting initial project results and speaking about other miner training initiatives. The following speakers presented:

- **The US Department of State** presented on the Minamata Convention, the global ASGM sector and linkages with APEC priorities and commitments.
- **The Artisanal Gold Council** presented the project and its results.
- **The Canadian International Resource Development Institute** shared their experience developing a gender training program for ASGM that could be delivered to small mining communities, LSM stakeholders and government officials involved in ASGM

The workshop also made use of breakout groups to develop a more comprehensive understanding of training needs required to help professionalize the ASGM sector. Groups answered the following questions:

1. What training needs do ASGM practitioners require if the sector is going to successfully become formal and mercury-free?
2. What training needs do government representatives require if they are going to help the sector become formal and mercury-free?
3. What training needs do large-scale mine operators need to interact with the ASGM sector?

Results & Lessons Learned

The workshop was attended by twenty-one APEC delegates from 5 APEC economies as well as representatives of LSM, civil society and the APEC Secretariat

The breakout groups produced a syllabus of training needs for the various stakeholders involved in improving ASGM practices. The following table shows the results of the breakout group work.

ASGM training needs	Government training needs	LSM training needs
o **Laws/regulations of jurisdiction of operating** o **Use of personal protective equipment**	o Viable Hg-free processing techniques o Collection of reliable data on the sector	o Mercury risks to operations o Business plans/blue prints for transitioning to Hg processing

o **Mercury free processing techniques** o **Setting up bank accounts** o **Gender sensitivity** o **Advanced business skills for mine owners**	o Calculation of compensation for Hg affected communities o Promoting dialogue between LSM and ASM o Setting up mobile laboratories (assays etc.) o Labour standards and human rights	o Offering apprenticeships or training programs to small-scale miners o Case studies of partnerships between LSM and ASM

Table 8: Results from breakout groups at Mining Week 2018 workshop facilitated by Artisanal Gold Council and US Department of State.

APEC Mining Week 2019, Chile

Workshop Objectives

The workshop was the final requirement for this project, designed as an opportunity to present the results of the project to representatives from APEC economies, particularly those involved in the mining sectors of their economies. The workshop was a <1-day event intended to explore the intersection of miner training, professionalization of the sector and investment in responsible artisanal gold production. The workshop included presentations from the contractor, complementary presentations from other organizations, and a case study exercise with the participants to maximize engagement and constructive input.

Workshop Organization

The project workshop was scheduled within 2019 APEC Mining Week, held in Copiapó, Chile, from 5 to 8 August 2019. APEC Mining Week is a high-level event which comprises a variety of activities to foster cooperation and advance common interests for the mining sector. Mining Week gathered Chilean and international experts, businesses and government officials from mining, energy, natural resources, economy and trade offices. The theme for this year's event was "Inclusive and Sustainable Mining for the Future", within which the topic of economically and environmentally sustainable artisanal mining fit very well.

The contractor was given a half-day time slot on Tuesday, 6 August 2019 for the workshop. The contractor developed an agenda for the workshop, in collaboration with the Project Overseer (PO), the USDoS and the APEC Mining Week organizing team.

With the assistance of the secretariat, the PO and the contractor issued invitations to travel-eligible economies with ASGM sectors (Chile: Indonesia; Malaysia; Papua New Guinea; Peru; and Viet Nam) to send project-funded delegates to the workshop, as well as an invitation to all APEC economies, encouraging the participation of self-funded delegates in the workshop. Viet Nam submitted a request to send two project-funded delegates.

Nominations of qualified female participants were encouraged.

Workshop Delivery

The project results workshop was held on Tuesday, 6 August 2019 at the APEC Mining Week in Copiapó, Chile. The workshop agenda was designed to provide some context on the global ASGM sector, present project results, and provide space for a panel of experts to speak about various efforts to formalize the sector and address mercury use by small-scale miners. The following stakeholders participated in the delivery of the workshop:

- **Antonio Canale-Mayet M., Encargado de Relaciones Internacionales, Ministerio de Minería, Gobierno de Chile** provided an introduction to the workshop including comments on mercury in artisanal mining, the Minamata Convention, and the importance of a sustainable artisanal mining sector to APEC economies.
- **The US Department of Labor** shared lessons learned in implementing ASGM sector improvement initiatives throughout Africa and Latin America.
- **The Empresa Nacional de Minería de Chile** shared information with the project on their model for sector formalization through technical support and mineral market development for small-scale gold miners in Chile.
- **The Artisanal Gold Council** presented on the context of the global ASGM sector, the project results, and other global efforts to support professionalization of ASGM that might offer opportunities to apply the results from this project.
- **The US Department of State** presented on the Minamata Convention and current USDOS strategies for supporting the development of responsible and sustainable ASGM.

The workshop presentations are included as Annex 7.

The workshop concluded with a group activity: a case study was presented of an opportunity to invest in a mercury-free ASGM production facility, and the participants were invited to develop a checklist of requirements, from an investor perspective, that would enable the financing of such a project.

Results & Lessons Learned

The workshop had approximately 40 attendees, including two project-funded delegates from Viet Nam. Copies of the business training curriculum were made available to interested parties.

The facilitated group activity produced a map of investor information needs in order to determine whether to proceed with an investment in a mercury-free ASGM operation. This map can be used to develop future training materials for miners which can help them understand the investor perspective in ASGM, and help miners develop some of the more specialized skills required to document the technical, legal and corporate information that an investor might seek before committing finance to an ASGM project. The following table shows results from this brainstorming session.

Technical	Legal	Corporate
o **Where does the mineral come from?** o **What are the ore qualities?**	o Land title/easement o Legal framework - federal o Environmental permits ▪ Due diligence	o Reliability/transparency o Trustworthy/business track record

o **Size of the deposit/resource** o **Grade of the ore** o **Production history** o **Purity** o **Mining plan/design** o **Processing plant design**	▪ Ability to finance guarantee	o Background/management skills o Business plan ▪ Economy risk plan ▪ Market forecast ▪ Social/community license ▪ Market potential ▪ Customer assessment ▪ Labour standards/worker treatment ▪ Permitting plan ▪ Experience/technical knowledge of the team ▪ Competition analysis ▪ Risk analysis and management plan

Table 9: Results from facilitated group activity brainstorming session at Mining Week 2019 workshop facilitated by Artisanal Gold Council and US Department of State.

Despite working with the APEC Secretariat to invite delegates from member economies as well as identifying specific government and civil society institutions that may be interested in sending delegates to the workshop, uptake by member economies for sending delegates was limited.

IV. Impact of this Project

Achievements

The following table presents key achievement indicator targets and results:

Indicators	Target	Results
# miners trained	40M/40F	174M/181F
# sites receiving training	4	7
# domestic trainers trained	4	4
# economies field tested	4	4
# of APEC fora in which materials were shared	1	2
# downloads/copies of training curriculum shared	n/a	21

Table 10: Project impact by the numbers.

Outputs

Sixty-eight organizations were contacted across 6 APEC economies and 18 non-APEC economies to survey for existing and accessible curricula and training modules for stakeholders within the ASGM sector, creating an important database of existing and planned training materials that can be accessed for various audiences and contexts.

The business training module output was a complete curriculum including teaching materials, student materials, guidelines for instructors, evaluation materials, and additional learning resources. The curriculum is customizable in order to be adaptable to a range of geographical, cultural and educational circumstances, and under consideration of local realities. Key to the impact of this project is that the business training curriculum is open access; available for use by APEC economies including those with ASGM practitioners or educators, in part or in full, without cost or other use barriers and with adaptations and customization to the materials encouraged. This will enable the greatest impact in terms of the number of ASGM miners that can be reached. Other aspects improving accessibility will be the platforms on which the curriculum will be available, the formats, and the languages it is available in (currently English and Spanish).

Through the field testing activities, a total of 355 individuals (174 men; 181 women) participated in the business training modules delivered in Indonesia, the Philippines, Papua New Guinea and Peru. These individuals received accessible, practical training in concepts and skills needed for successful business operation, making good financial and business decisions, and supporting the sustainability of their businesses, all tailored to the artisanal and small-scale gold mining sector.

The half-day workshop held during the agenda of APEC Mining Week in Copiapó, Chile, gave the contractors an opportunity to share the results of the project, as well as describe how the outputs will be made available to the economies for their use.

Creating partnerships and engagement around the products of the project was a key success. Discussions were held with other funding agencies and donors (Global Affairs Canada, GIZ, UNIDO, UN Environment, Trafigura) around adapting the business training curriculum for use in their ASGM programming. The Natural Resources Defence Council (USA) has been engaged through their participation in the Global

Environment Facility funded project GEF GOLD Global, to use and adapt the curriculum developed for this project as contributing towards the outcomes of GEF GOLD projects occurring in the APEC economies of Peru, Indonesia, and the Philippines, and the non-APEC economies of Colombia, Guyana, Kenya, Burkina Faso and Mongolia. If adopted by GEF GOLD projects, the curriculum would have the potential to reach several dozen additional mining communities and thousands of additional miners.

Sustainability

This project primarily focused on collecting and analysing data for the creation of a training module that helps ASGM practitioners improve their operations and livelihoods by improving their understanding of business and finance. The sustainability of the impacts focuses on how these outputs will be made available and provide value to stakeholders within the APEC economies and beyond going forward.

The data on existing and planned training materials for the ASGM sector provided invaluable and here-to-fore undocumented information that can be used to both provide access to, or building blocks for the development of further, educational tools by practitioners in APEC economies. Reducing the resources needed to access or develop these learning tools will support the sector in its evolution towards increased professionalization.

The database of training materials is available for download from the contractor's website, and they encourage that it be made available on the APEC website, improving the accessibility for APEC economies. The contractor will also continue discussions with other funding agencies and donors (Global Affairs Canada, GIZ, UNIDO, UN Environment USDOS) around adapting the business training curriculum for use in their ASGM programming in Sierra Leone, Burkina Faso, Mongolia, Philippines, and Suriname.

The contractor will also continue engaging the Natural Resources Defence Council (USA) through their participation in the Global Environment Facility funded project GEF GOLD Global, who will feature the training materials on their planetGOLD website – a clearinghouse of resources for ASGM mercury reduction projects occurring in the APEC economies of Peru, Indonesia, and the Philippines and the non-APEC economies of Colombia, Guyana, Kenya, Burkina Faso, and Mongolia. The curriculum will thus have the potential to reach several dozen additional mining communities and thousands of additional miners world-wide.

To further the potential for its positive impact on miners and mining communities, the curriculum was designed as a foundation on which further and more contextually specific business skill gaps can be identified and addressed. The curriculum thus includes a component aimed at not just teaching basic business competencies but also identifying other business skill needs around which future capacity building resources can be mobilized.

The field delivery of the business training curriculum offered an opportunity to improve the sustainability of the project impacts by building capacity for partners through their inclusion in the delivery of training. BAN Toxics! Staff in the Philippines were trained as trainers in curriculum delivery as was the Colorado School of Mines (USA), AMAN (Indonesia), Sustainable Alluvial Mining Services (PNG) and Alliance for Responsible Mining (International NGO based in Colombia). These organizations can continue to offer the training beyond the life of this project.

The success of the field training in Esa'ala, PNG as well as the workshop held during the 2018 APEC Mining Week in PNG led directly to the development of a $380,000 project on capacity building, miner training

and mercury reduction. The project is funded by the USDoS and will be implemented by the AGC in partnership with the PNG Mineral Resource Authority and the Small-scale Mining Training Center located in Wau, PNG. The training materials developed under this project will be integrated into the enhanced miner training programs of the Small-scale Mining Training Center, and complimentary health training materials will be developed to support the business curriculum. The survey results will once again be used to coordinate with other international programs delivering miner training in order to avoid duplication of efforts. This project represents a significant investment in mercury control and reduction in an APEC economy as a direct result of this APEC sponsored work.

Delivering the workshop within the agenda of APEC Mining Week 2019 was an excellent opportunity to create sustainability by transferring knowledge about the outputs of this project among the APEC economies. Those who work with the mining sector are key champions when it comes to spreading the impact of these project outputs, ensuring that the project's training module can be made available to interested groups within their economies.

Key sustainability outcomes
• **Database of existing training ASGM training materials created as a reference for ongoing ASGM improvement initiatives**
• **Capacity for business training developed in 4 APEC Economies – follow up business skills trainings planned**
• **380K USD invested in miner training and mercury reduction in PNG as a direct result of project activities**
• **Training materials shared and promoted through planetGOLD to mercury reduction projects in 7 economies globally**

Lessons Learned

1. Most organizations conducting miner training are not communicating or sharing materials with each other.
2. Most miners can only commit to training for 4-5 hours at a time. Training agendas should be structured, and delivery planned accordingly.
3. Gender inequity is an important consideration in training situations. Measures must be taken such that training does not exclude women due to gendered responsibilities like child-care and other family responsibilities.
4. The introductory level of the materials was appreciated and deemed appropriate by the target audience.
5. Demand for business training is high. Many miners travelled large distances to be part of the training workshops and expressed a desire to participate in any follow-up business training activities.
6. The evaluation materials should be used as a diagnostic tool to develop more nuanced and customized trainings responding to the specific desired learning outcomes of the training group.

7. Most miners do not have the means to invest in mercury reduction technology on their own; it is often site owners who will make business decisions about investing in improved operations. More advanced materials targeting site owners and/or mining associations that display a higher degree of professionalization should be developed.

8. Future, more advanced materials should be focused on bridging the gap between the investment community and the ASGM community. Benefits would be seen from supporting miners in developing more detailed technical, operational and financial business plans and on how to communicate these plans to investors.

V. Recommendations for Future Work

The following are recommendations for future work that would build on the results of this project.

- Creating a database of freely available training materials in a knowledge bank such the GEF GOLD ASM International Knowledge Hub, UN Environment NAP Wheel of Knowledge, Pact and the World Bank's Delve project, or the Extractives Hub Beta. This kind of centralization would reduce resources spent on designing new material when there are existing training materials available, or materials that only need to be translated into other languages, as well as increase coordination between organizations with similar stakeholders and goals.
- Developing further training materials based on survey results and workshop feedback (see Table 7).

Markets & value chains	Policy, legislation and formalization	Acquiring and presenting technical information
• **Minerals beneficiation and value addition** • **How to build demand for mercury-free gold** • **Attracting private sector investment to ASGM operations** • **Partnership development with mining companies and other stakeholders**	• Economy specific mining regulation and policy • Economy specific formalization training (steps to become formal) • Formalization best practices • Organizing for miners (forming associations, cooperatives, unions and advocacy organizations)	• Size of the deposit/resource • Grade of the ore • Production history • Purity • Mining plan/design • Processing plant design
Navigating and conforming to legal requirements	**Building a corporate entity that attracts investors**	
• **Land title/easement** • **Legal framework** • **Environmental permits** • **Due diligence**	• Transparency • Management skills • **Business plan** • Social/community license	

Table 11: Recommendations for further topics of interest for training materials based on input collected through project activities.

- Pair the training materials with projects and programs aimed at diversifying the economic opportunities in ASGM communities to enhance the learning outcomes through praxis. Examples include jewelry manufacturing businesses, supplies manufacturing such as local mercury retort construction, and mining services such as transportation and food.

- Focus more on the site decision makers (typically owners or association representatives) in order to encourage adoption of mercury-free processing technologies. Conduct training needs assessments for this subgroup of miners.
- Future efforts should focus on outputs related to building robust business plans to attract investment. Outputs might include: templates and checklists, equipment pricing guides, formalizing business partnerships, guidance on communicating with investors, regulatory case studies, frameworks for financing models, marketing gold, etc.
- Translating the business training module into French to meet the language gap observed in the survey on ASGM training materials.
- Link business training materials with the development of national action plans to reduce/eliminate mercury under the Minamata Convention through the promotion of materials under the Global Mercury Partnership.
- Link the business training materials with strategies to encourage the upstream compliance with Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas such as artisanal and small-scale mining organisations attempting to implementing the CRAFT Code.
- Continue exploring partnerships and collaborations with other funding agencies and donors around adapting the business training curriculum for use in their ASGM programming.

Annex 1: Survey Questions

Assessing Gaps in ASM Miner Training Materials

Section 1 of 5

What is the name of the organization/entity you represent?

How are you involved in the ASGM sector?

- ☐ Mining company
- ☐ Government
- ☐ Consumer
- ☐ Service provider
- ☐ Investor
- ☐ Non-governmental organization/Not-for-profit
- ☐ Other…

Has your organization ever designed training tools for the ASGM or associated sectors? Training tools or training materials could include things such as presentation slides, booklets, flip charts, online tools, websites, curricula, handouts, videos or other formats intended to educate or build knowledge and capacity of miners.

- ☐ Yes
- ☐ No

Section 2 of 5

What topics did the training materials cover?

- ☐ Health & Safety
- ☐ Gender
- ☐ Mercury Reduction
- ☐ Business Skills
- ☐ Environmental Management
- ☐ Prospecting/Exploration
- ☐ Other…

Briefly describe the training tools your organization has developed. Please include a brief description of the format of the tool(s) - eg: presentation slides, booklets, flipcharts, online tools, websites, curricula, handouts, videos, etc. If you are describing more than one tool, please label them "Tool A; Tool B;" etc.

Who are the intended trainees for these materials? (If you have more than one training tool available, please use a different row for each one)

- ☐ Tool A
- ☐ Tool B
- ☐ Tool C
- ☐ Tool D
- ☐ Tool E

    - o Artisanal or small scale miners/processors or their families
    - o Investors/Financiers
    - o Government officials
    - o Consumers
    - o Other

Are the tools freely distributed/available for other organizations to use?

- ☐ Yes
- ☐ Yes, with conditions
- ☐ No

If they are not freely available, or are available only with conditions, how can they be accessed by other ASGM stakeholders?

Are you willing to share these tools with the Artisanal Gold Council for the purposes of this gap analysis?

- ☐ Yes
- ☐ No
- ☐ Maybe
- ☐ Other…

What language(s) are these tools available in?

- ☐ English
- ☐ French
- ☐ Spanish
- ☐ Other…

Training tools can be PROCESS-driven or CONTENT-driven. Process-driven tools are usually delivered to the user by a trainer or facilitator, as in a presentation or interactive activity. Content-driven tools are things the user would read, view or do independently, such as a video or booklet. Which category do your tools fall into?

- ☐ Tool A
- ☐ Tool B
- ☐ Tool C
- ☐ Tool D
- ☐ Tool E

  - o Process-Driven
  - o Content-Driven
  - o Both
  - o

Please describe how users access your training materials. Include information on cost of use. (i.e. Freely available for download, handed out at organization's events, facilitated trainings held when requested, etc.)

Section 3 of 5

Does your organization plan to develop any training materials in the next 24 months?

- ☐ Yes
- ☐ No

Section 4 of 5

What topics do these training materials intend to cover?

- ☐ Health & Safety
- ☐ Gender
- ☐ Mercury Reduction
- ☐ Business Skills
- ☐ Environmental Management
- ☐ Prospecting/Exploration
- ☐ Other…

Who are the intended trainees for these materials? (If you plan to have more than one training tool available, please use a different row for each one)

- ☐ Tool A
- ☐ Tool B
- ☐ Tool C
- ☐ Tool D
- ☐ Tool E

- Artisanal or small scale miners/processors or their families
- Investors/Financiers
- Government officials
- Consumers
- Other

Section 5 of 5

Are you aware of any other institutions or organizations who have developed educational tools or conducted trainings for the ASGM sector in the following areas: health and safety, gender, mercury reduction, business skills, environmental management, or prospecting/exploration? Please list any you can think of, along with the kinds of tools they have developed (if you know).

Are there OTHER topics in the ASGM sector that you would like to see educational tools developed for? If so, please list the topics you would like to see covered.

Are you willing to be contacted directly by the AGC for further inquiry regarding the ASGM educational material you have/are planning on developing?

- ☐ Yes
- ☐ No

Are you willing to have the information you have provided in this survey, including the name of your organization, included in a report that may be made available to ASGM stakeholders?

- ☐ Yes
- ☐ No

Annex 2: List of Survey Recipients

	Institution/Individual	Location
1	Agenda for Environment and Responsible Development	Tanzania
2	Alliance for Responsible Mining	Colombia
3	Artisanal Gold Council	Canada
4	ASM Department	
5	BanToxics	Philippines
6	Barrick Gold	Canada
7	Benguet Corporation	Philippines
8	Better Gold Initiative	Switzerland
9	BRI - Biodiversity Research Working Group	USA
10	Center for Natural Resource Governance	Zimbabwe
11	Centre D'Expertise en Gestion Miniere (CEGEMI)	DRC
12	Centro de Tecnologia Mineral (CETEM)	Brazil
13	Centro Tecnologico Minero (CETEMIN)	Peru
14	Canadian Interntaional Resources and Development Institute (CIRDI)	Canada
15	Change Equity	Canada
16	Communities in Artisanal and Small-Scale Gold Mining/Techniches Buro Fur Bergwesen Hruschka	N/A
17	Cumbre del Sajama	Bolivia
18	Dar es Salaam Institute of Technology	Tanzania
19	EduMine	Canada
20	Sustainable Artisanal Mining Project/ Engaging Stakeholders in Environmental Conservation Project	Mongolia
21	Estelle Levin Ltd.	UK
22	Friends of the Nation	Ghana
23	Geological Survey of Denmark and Greenland	Denmark
24	Geological Survey of Ecuador	Ecuador
25	Global Mercury Partnership	Switzerland
26	Goldcorp	Canada
27	GroundWork	South Africa
28	International Council on Mining and Metals	International
29	International Institute for Environment and Development	N/A
30	International Institute for Sustainable Development	N/A
31	Intergovernmental Forum on Mining Minerals Metals and Sustainable Development	International
32	Info mine	N/A
33	Kinross	Ecuador
34	Lundin Mining	Canada
35	Malawi Technical Education and Vocational Training Authority	Malawi
36	Management Systems International	USA
37	Material Efficiency Research Group	Canada

38	Mine Regulation	
39	Mining Association of Chile	Chile
40	Ministry of Environment	Nigeria
41	Ministry of Mines & Steel Development	Nigeria
42	MinTek Small Scale Mining and Beneficiation	South Africa
43	Newmont	USA
44	nmConsulting	
45	Natural Resources Defense Council (NRDC)	USA
46	PACT	USA
47	Partnership Africa Canada	Canada
48	Prospectors and Developers Association of Canada (PDAC)	Canada
49	Pure Earth	USA
50	RCS Global	UK
51	SEF Canada Ltd.	Canada
52	Social Solutions	Suriname
53	SOLIDERIDAD	Netherlands
54	Sustainable Alluvial Mining Services (SALMIS)	Papua New Guinea
55	TetraTech	USA
56	Teng Tuuma Geoservices (TTG)	Burkina Faso
57	University of British Columbia	Canada
58	University of Mines and Technology	Ghana
59	United Nations Development Program	International
60	United Nations Environment Program	International
61	United Nations Industrial Development Organization	International
62	USAID	USA
63	USGS	USA
64	Wau Training Centre	Papua New Guinea
65	World Bank	International
66	Yasan Tambuhak Sinta	Indonesia
67	Fundación Sonami; Sociedad Nacional de Minería	Chile

Annex 3: Selected Survey Responses by Organization[5]

Organization	Training Topics Covered	Briefly describe the training tools your organization has developed	Are the tools freely available for use?	How can the tools be accessed ?	Language(s)	Describe how users access your training materials	Plans for training materials in next 2 years
U.S. Geological Survey	Environmental Management Prospecting/Exploration Mapping and monitoring	Tool A: Remote sensing workshop using satellite imagery to map and monitor artisanal mining activities Tool B: Field course in Prospection/ exploration tools for small scale deposit identification (alluvail diamonds/gold) Tool C: GIS/GPS field mapping and modeling small scale alluvial deposits training (alluvial diamonds/gold) Tool D: Methodological Toolkit for Field Assessments of Artisanally Mined Alluvial Diamond Deposits	Yes, with conditions	These materials/training have been designed as in-person training and require some interaction with instructors. The materials can be freely distributed but may not be entirely applicable outside of the organized course sessions.	English French	We can provide training to interested parties dependent on available funding from U.S. Government. Additionally, training materials may be made available at no charge. Tool -D is a US Government publication and freely available for download at: https://pubs.usgs.gov/tm/11/d02/	Prospecting/Exploration Mapping and Monitoring
Sustainable Alluvial Mining Services	Environmental Management	Environmental Management HIV/AIDS Professional advice to investors/financiers in ASGM	Yes, with conditions	The materials can be accessed through contract basis or consultancy as the work I do is service provision.	English	All material produced will atleast come with a reasonable fee attached to a service provided.	Health & Safety;Gender;Mercury Reduction;Environmental Management;Prospecting/Exploration;Mining Proposals and Technical work
University of British Columbia	Health & Safety Mercury Reduction Environmental Management Technical solutions	Posters & brochures; videos; academic books; short courses for 20 economies (no further detail provided)	Yes		English Spanish	Distributed in the villages and Internet	Health & Safety;Gender;Mercury Reduction;Business Skills;Environmental Management;Prospecting/Exploration
Stakeholders Engagement for Sustainable Development	Gender Mercury Reduction Environmental Management	Tool A: Guide and posters on human right based approaches, including gender Tool B: Guide and hand outs for frugal rehabilitation of ASM degraded land; on site training hand outs	Yes		English Mongolian	Guides developed under the donor funded project available on the website, can be shared electronically by email.	Gender;Environmental Management;water resources and management

[5] Note that these tables represent a selection of raw data captured by the survey. The complete raw data set can be obtained by contacting the AGC.

		Tool C: Documentary film for public; stakeholder's engagement video for public.					
Ministry of Mines and Steel Development	Formalization Monitoring Regulatory Coordination and Inspectorate	Tool A: Training Manual for ASM Tool B: A comprehensive training modules for ease of understanding for all categories of government officials	Yes, with conditions	Direct from the office of the Director, Artisanal and Small-scale Department of the Ministry of Mines and Steel Development.	English	Freely available	All of above and more in areas not already covered
AGENDA for Environment and Responsible Development	Health & Safety Mercury Reduction Environmental Management	No detail given	Yes		English Kiswahili		Health & Safety;Mercury Reduction;Environmental Management;Minamata Convention
SDC Mongolia	Health & Safety Gender Mercury Reduction Business Skills Environmental Management Human Rights Mining Organisation and Community Building	Booklets websites, curricula, handouts, videos, presentation slides (no further detail given)	Yes		English Mongolian	download, events, trainings etc	Business Skills;Supply chains and mineral trading
Small Scale Mining Training Centre-Papua New Guinea	Health & Safety Gender Mercury Reduction Business Skills Environmental Management Prospecting/Exploration Mining & Processing Basic Geology & Gold Mine Legislation Personal Development HIV/AIDS	Learning Modules/Booklets, Presentation slides, Handouts/Leaflets etc. (no further detail given)	Yes, with conditions	By consulting our organisation	English	Most users access our training materials during events facilitated by our organisation. Others request by email or phone calls and information are sent to them.	Prospecting/Exploration;GPS & MapInfor, Planning & Management in ASGM
UN Environment	Mercury Reduction Environmental Management	Tool A: UN Environment has developed a geo-spatial platform called MAP-X. MAP-X will be pilot tested to support National Action Plan implementation under the Minamata Convention to support the mercury inventory assessment and progress monitoring generally. Tool B: In addition, MAP-X will be tested to map and assess informal and abandoned AGSM sites and	Yes, with conditions	The platform will be freely available but certain datasets may not be publicly shared	English	Freely available online.	Environmental Management

		monitoring of the rehabilitation of mercury and cyanide contaminated sites.					
CETEM - Centre for Mineral Technology	Mercury Reduction Business Training Environmental Management	Tool A; Mercury reduction training Tool B: Retort use training	Yes, with conditions	Printed materials are open access by contacting our Institution for details. In the case of devices such as retorts, fume extractors etc., we recommend to contact CETEM for more information.	Portuguese	Regarding the devices to be used, we provide the information, design etc., which is just a matter of make them; the printed matter can be accessed in our library.	Reduccion del Mercurio;Capacitacion Empresarial;Gestion Ambiental
PDAC	Prospecting/Exploration Community Engagement	Tool A: Early stakeholder engagement guide for mining companies	Yes		English	Website	Health & Safety;Prospecting/Exploration
Mintek	Health & Safety Mercury Reduction Business Skills Environmental Management	Booklets, environmental guidelines, curriculums, presentations	Yes, with conditions	Through project agreement	English	These are done on a project basis. Funding has to be acquired from donor agencies	Health & Safety;Mercury Reduction;Business Skills;Environmental Management
Estelle Levin Ltd	Health & Safety Gender Mercury Reduction Environmental Management Prospecting/Exploration Extracting, crushing, grinding, sieving, using sluice boxes	Tool A: Training manuals for the Ministry of Mines in Ethiopia, in booklet format with handouts Tool B: In-country training session delivered to cooperatives and Women's Groups in Ethiopia	Yes		English Amharic	They are held by the Ethiopian Ministry of Mines. Copies can be requested from Estelle Levin Ltd	Business Skills
ICMM	Guide to engagement between ASM and LSM	Downloadable guidance document	Yes		English		
Sociedad Nacional de Mineria - Fundacion Tecnologica	Health & Safety Prospecting/Exploration	Presentations and booklets (no further detail provided)	Yes		Spanish	Handed out at organizations	Business Skills
Pure Earth , Blacksmith Institute	Health & Safety Gender Mercury Reduction Environmental Management	Pure Earth has conducted education and training on the dangers of mercury and mercury-free gold processing methods for small-scale and artisanal gold miners in several economies. These trainings include presentation, booklets, and hands-on training about how to efficiently process gold without mercury.	Yes, with conditions	We can make our tools available, but like to make sure their use in in accordance with our mission.	English Spanish Bahasa Indonesia, Mongolian, Russian	available for download, given out at training sessions, sessions held at request	Health & Safety;Gender;Mercury Reduction;Environmental Management
Solidaridad	All topics	Tool A: App Fair Gold (Android Tool B: presentation slides	Yes		English Spanish	http://www.solidaridadsouthamerica.org/es	

		Tool C: publications; Tool D: Specialization courses Tool E: videos Tool F: Investigations					Health & Safety;Gender;Mercury Reduction;Business Skills;Environmental Management
Cumbre del Sajama	Health & Safety Gender Mercury Reduction Business Skills Environmental Management Prospecting/Exploration Community relationships	Tool A: Presentations on different topics to educate miners and other stakeholders. Tool B: Booklets with graphics regarding mining issues (health, mercury, gender, others).	Yes		Spanish	Handed out at organizationÂ´s events	Health & Safety;Gender;Mercury Reduction
CETEM	Health & Safety Mercury Reduction	Handoust; presentation slides,videos (no further information provided)	No	They were provided in the past, through some projects but they are no longer available.	Portuguese	It was free.	Health & Safety;Gender;Mercury Reduction;Business Skills
Instituto Nacional de Investigacion Geologico, Minero y Metalurgico	Health & Safety Gender Mercury Reduction Environmental Management Prospecting/Exploration Optimization of the mining cycle and metallurgy.	Tool A: Presentation slides for socializations, trainings and workshops. Tool B: Booklets for socializations, trainings and workshops. Tool C: Videos for socializations. Tool D: Triptych to advertise socializations, trainings and workshops.	No	The tools may be available with a formal request addressed to the executive director of INIGEMM.	Spanish	The training materials are handed out at organization's events.	Mercury Reduction;Environmental Management;Optimization of the mining cycle ang metallurgy
Artisanal Gold Council	Health & Safety Gender Mercury Reduction Environmental Management ASGM inventories	Tool A: Health flip chart for miners and families Tool B: Health manual for health professionals Tool C: Health training curricula booklet for instructors Tool D: Guidelines for developing a public health strategy for National Action Plans Tool E: Retort Use Guide Tool G: Practical guide for mercury reduction in ASGM Tool H: Practical guide for gravimetric system use and maintenace Tool I: Mercury inventory guidelines	Yes, with conditions	2 tools (D&E) are draft and for internal AGC use only Tool H is in draft form and specific to the processing system used	English French Spanish	available on website, handed out at events	Health & Safety;Gender;Mercury Reduction;Business Skills;Environmental Management;Prospecting/Exploration;asgm inventory for NAP practitioners
Yayasan Tambuhak Sinta	Mercury Reduction Business Skills	Tool A: Mercury Health Awareness Brochures for Miners and Height Charts and Stickers for Women and Children;	Yes, with conditions	Upon Request	Bahasa Indonesia	Materials are distributed through YTS training programs and fieldwork. Some	Health & Safety;Gender;Mercury Reduction;Business Skills;Minamata Convention

		Tool B: Website on ASGM and Mercury; Tool C: Awareness and Training Videos on Mercury and ASGM; Tool D: Training Modules on Small Business and Personal Financial Management				materials are available online through website, YouTube, etc	
MoH	Health & Safety	handbook, guidelines	Yes, with conditions	can be accessed by website, because hard copy is limited	indonesia	if the training materials are ready, can be accessed by website	Health & Safety;Mercury Reduction

Annex 4: Photos of Training Sessions

Bryan Koehler (trainer of business training) with a business training recipient in Tobongon, North Sulawesi, Indonesia

Participants of Business Training in Konut Village, Puruk Cahu, Central Kalimantan, Indonesia

Women miners participated in a group exercise during the business training, Parenggean, Central Kalimantan, Indonesia

The participants of Business Training in Tatelu, North Sulawesi, Indonesia

Participants complete a pre-course assessment exercise on Normanby Island, Esa'ala District, PNG

Annex 5: Sample Training Agenda

*Note that the following agenda is a guideline only. It is recommended that the complete curriculum be delivered over a minimum of two days; however more time can and should be allocated depending on the interests, availability and learning needs of participants.

DRAFT CLASSROOM TRAINING AGENDA		
Day 1		Mins.
8:30-9:00	**Presentation of participants and training agenda**	40
9:00:9:15	**Student Evaluation pre-test/Course Objectives**	20
9:15-9:30	**Module 1 - Introduction to the training**	20
9:30-10:00	*Module exercise, questions, discussions*	30
10:00-10:15	TEA BREAK	15
10:15-10:45	**Introduction to Module 2 – Basic business terminology**	30
10:45-11:45	*Module 2 workshops – Business organization charts and roles*	60
11:45-12:45	LUNCH	60
12:45-13:15	**Introduction to Module 3 – Profit, revenue, supply**	30
13:15 -13:45	*Questions and discussions – ASGM Specific supply needs and profit/expense streams*	30
13:45-14:15	*Exercise 1 – Profit calculation*	30
14:15-14:45	*Exercise 2 – Supply management and supplier selection*	30
14:45-15:00	TEA BREAK	15
15:00-15:45	**Introduction to Module 4 – Health, safety and environment**	15
15:45-16:00	Questions and Discussions – Importance of health, safety, and environmental management including the Minamata Convention	15
16:00-16:15	*Exercise 1 – Hazard identification*	15
16:15-16:30	*Exercise 2 – Scenario: Site management and housekeeping*	15
16:30- 17:00	**Introduction to Module 5 – Funding, financing, and investors**	30
17:00-17:30	*Daily wrap-up, summary*	30
Day 2		
8:30-9:00	**Introduction to Module 6 – Basic budgeting and business management**	30
9:00-10:00	*Basic budgeting and business management exercise – Personal budget Part 1*	60
10:00-10:15	TEA BREAK	15
10:15-11:00	*Basic budgeting and business management exercise – Personal budget - Part 2*	45
11:00-12:00	*Basic budgeting and business management exercise – Small business expenses Part 1*	45
12:00-13:00	LUNCH	60
13:00-13:45	*Basic budgeting and business management exercise – Small business expenses Part 2*	45
13:45-14:15	**Introduction to Module 7 – Basic financial accounting**	30
14:15-15:15	*Basic financial accounting - Exercise 1 – Class example*	60
15:15-15:30	TEA BREAK	15
15:30-16:30	*Basic financial accounting - Exercise 2 – Group project*	60
16:30-17:15	**Closing remarks/course evaluation**	45

Annex 6: Business Training Module

- A digital copy of the Business Training Curriculum in English including all teaching and learning materials is available from the AGC website or at this link: Business Training Module ENGLISH

- A digital copy of the draft Administración De Empresas Pequeñas En El Sector De La Minería De Oro Artesanal Y En Pequeña Escala in Spanish is available from the AGC website or at this link: Módulo de Formación Empresarial Español

Annex 7: Workshop Presentations

- All presentations from the ***Developing Training Materials to Promote the Reduction of Mercury Use in Artisanal and Small-scale Gold Mining*** workshop held as part of APEC Mining Week 2019 are accessible from the AGC website or online at this link: Presentations from Developing Training Materials Workshop APEC Mining Week 2019