RESPONSIBLE TIN PRODUCTION GUIDE

OCCUPATIONAL HEALTH & SAFETY
# TABLE OF CONTENTS

**INTRODUCTION** ................................................................. 3

**OVERVIEW OF THE APPROACH** ........................................... 4

**PHASE I: ENGAGEMENT** ...................................................... 6

- **Step 1**  Tin Producers to Assume Responsibility for Improving Conditions in Supply Chains Through Policy or Other Forms of Commitment
- **Step 2**  Map Supply Chain and Understand Sources of Tin
- **Step 3**  Identify ASM, Sites, and Communities to Work With
- **Step 4**  Obtaining Buy-in and Commitment from ASM

**PHASE II: RISK ASSESSMENT AND WORK PLAN.** ................. 8

- **Step 1**  Consult Previous Studies and Available Data on OHS Risks for Indonesian Tin Production
- **Step 2**  Engage with ASM to Understand their Concerns and Record Results
- **Step 3**  Ensure Expectations of the International Buyers are Met
- **Step 4**  Design Engagement and Workplans in Consultation with the ASM and Communities

**PHASE III: IMPLEMENTATION.** ............................................. 11

- **Step 1**  Implement Technical Capacity Building
- **Step 2**  Implement Behavioral Change

**PHASE IV: MONITOR & EVALUATION, AND SCALE** ............... 12

- **Step 1**  Monitor Activities and Measure Progress
- **Step 2**  Scale to Other Sites/Communities

**TWG PILOT PROJECT: CHALLENGES AND SOLUTIONS** .......... 13

**REFERENCES** ..................................................................... 14

# TABLE OF FIGURES

**Fig. 1**  ASM operations in upstream tin supply chains.......................................................... 5
**Fig. 2**  Common Major OHS Risks Found in ASM Sites ....................................................... 8
**Fig. 3**  Technical Responses Available for Common OHS Site Issues.................................. 8
INTRODUCTION

The implementation of good Occupational Health and Safety (OHS) practices in mining is essential to protect the lives and well-being of miners. In the case of Indonesia, a critical component of successful OHS implementation is the support of artisanal and small-scale miners (ASM), who account for a significant proportion of mineral production. However, ASM often operate outside of the direct control of tin producers and their engagement can be complex.

In this context, the Indonesia Tin Working Group (TWG) conducted a pilot project in Bangka Belitung, Indonesia, focusing on reclaiming land and developing a community-based business model.

It is important to note that there is no one-size-fits-all approach, therefore it is critical to understand that the recommendations in this Practical Guide are based on pilot projects and that other OHS implementation methods may be equally effective.

This guide provides a toolbox, compiling resources, standard operating procedures (SOPs), lessons learned, and references to relevant literature, which are intended for tin producers or other tin mining stakeholders interested in improving OHS practices at the ASM level.

This Practical Guide is based on work conducted by the Tin Working Group and partner organizations. It draws heavily on the experience, and uses deliverables of, the TWG’s main partners on OHS:

- **PACT**, specifically for the ASM Occupational Health & Safety Guidance for Risk Management developed in TWG Phase 1.
- **Earthworm Foundation**, specifically for the implementation of the OHS capacity building pilot project in TWG Phase 2.

TIN WORKING GROUP (TWG) OVERVIEW

**TWG**: A multi-stakeholder group working with downstream companies, tin processors and producers, civil society, industry associations as well as central and regional Indonesian government.

**Vision**: Responsible tin mining practices in line with international best practices are adopted and implemented by the majority of tin producers in Indonesia, resulting in better social and economic conditions for Indonesia tin mining communities.

**Phase I (2014-2017)**: Initiated research for a contextual understanding and background on the Indonesian tin industries’ challenges and opportunities.

**Phase II (2017-2019)**: Utilized Phase I information for the implementation of pilot projects (Land Reclamation & Occupational Health & Safety).

**Funding and Main Project Partner for Phase II**: European Partnership for Responsible Minerals (EPRM).
OVERVIEW OF THE APPROACH

OHS practices in Indonesia are rooted in complex relationships between ASM and tin producers. Taking into account these relationships, the steps outlined within this Practical Guide support a supply chain approach, where producers and ASM work collectively to improve conditions in the supply chains.

Specific to ASM in Indonesia, legal operations can broadly be divided into two groups:

1. ASM operating within a company concession or a concession with an Izin Usuha Pertambangan (IUP).
2. ASM operating on community mining areas or Wilaya Pertambangan Rakyat (WPR). These miners require individual mining licenses called Izin Pertambangan Rakyat (IPR) to mine in a WPR concession.

On company concessions, ASM groups operate as groups of four to five miners making up one team on a site. In some structures, ASM operations are more formal with each team requiring one operational lead known as Pawangung Jawab Operasi (PJO). In such cases the OHS manager of the company owning the concession has oversight of the ASM and directly liaises with the ASM groups’ PJOs. These ASM groups sell the mined tin ore to the company through small business enterprises called ‘CVs’. Each CV is comprised of four or five groups’ leads (PJOs).

In other companies, IUP miners are less organized and do not need to create ‘CVs’ to sell their ore to the company on whose concession they set up their sites. The OHS manager of the company owning the concession provides operational oversight to less formal operations as well.

IPR miners also operate in teams of four or five requiring one license. These miners can sell their ore to companies directly, or via collectors acting as middlemen in the supply chain. However, these groups of miners have no operational oversight from a company. In addition, these groups rarely remain constant as licenses are only valid for a period of five (5) years.

Therefore, if a WPR miner loses his license, he or she may simply join another group of miners with an IPR at a different site. Thus, neither the miners nor the mine sites remain consistent. In some cases, these miners may be settled in small communities around a WPR concession.

Figure 1 provides a simplified description of the different types of ASM operations in the tin sector in Indonesia:

A. One IUP site where ASM groups are organized into small enterprises to sell tin ore to a company
B. One IUP site where the ASM group sells tin ore directly to a company
C. One IPR group operating on the WPR concession
Figure 1: ASM operations in upstream tin supply chains

Source: (EARTHWORM, 2018)
PHASE I: ENGAGEMENT

STEP 1: TIN PRODUCERS TO ASSUME RESPONSIBILITY FOR IMPROVING CONDITIONS IN SUPPLY CHAINS THROUGH POLICY OR OTHER FORMS OF COMMITMENT

Applying a supply chain approach requires the commitment of both ASM producers and their buyers. As there is often no direct control by the tin producer, obtaining such commitment is a critical first step in improving OHS practices. To achieve change means the tin producer is asked to assess their supply chain, acknowledge where practices may be improved, and take responsibility for implementing change even beyond the operations they directly control.

STEP 2: MAP SUPPLY CHAIN AND UNDERSTAND SOURCES OF TIN

Applying a supply chain approach requires the commitment of both ASM producers and their buyers. As there is often no direct control by the tin producer, obtaining such commitment is a critical first step in improving OHS practices. To achieve change means the tin producer is asked to assess their supply chain, acknowledge where practices may be improved, and take responsibility for implementing change even beyond the operations they directly control.

STEP 3: IDENTIFY ASM, SITES, AND COMMUNITIES TO WORK WITH

Tin producers may find a significant number of ASM miners in their supply chain. To create buy-in and trust among ASM communities, it is important to begin by selecting a group of miners, sites, and / or communities.

Tin producers may consider the following factors here:

- Size of the mine with a focus on small-scale mining
- Sustainability for mining
- Risk of uncontrolled workplace accidents
- Openness of the artisanal miners and / or community to make improvements
- Distance between one mine to the other
- Structurally insecure or high-risk mines

STEP 4: OBTAINING BUY-IN AND COMMITMENT FROM ASM

Methods for engagement with artisanal miners could include formal and informal meetings as well as focus group discussions. These can be accomplished through the producer or with support of community engagement specialists, who can conduct social mapping exercises. The engagements should be directed towards building project buy-in and commitment from the miners and can be further enhanced by including the relevant government agencies as well.

“CHAMPION APPROACH”

Implementing activities in the community mining concession is more challenging than miners on company concessions as the community miners are loosely organized, not tied to one site for a long time, and have little or no direct relationship with the buying company.

In this context, the ‘champion’ approach builds a relationship with the lead miner at the selected pilot site in the WPR. By working closely with the lead miner, it is easier to enlist the participation and interest of other miners in the community concession. Thus the ‘champion’ can act as the primary point of contact for engaging and convening the community miners.
**PHASE II: RISK ASSESSMENT AND WORK PLAN**

**STEP 1: CONSULT PREVIOUS STUDIES AND AVAILABLE DATA ON OHS RISKS FOR INDONESIAN TIN PRODUCTION**

Several pilot projects on OHS have already been implemented in Indonesia and a growing data set is available on hazards and risks commonly associated with ASM tin production in Bangka-Belitung. Using existing resources and data will allow ASM and tin producers to allocate time and resources more efficiently and avoid previous challenges risks.

Existing data can be accessed in publicly available reports (e.g. the [ASM Occupational Health & Safety Guidance for Risk Management](https://asm-sector.org/)) or through collaboration with peers.

**STEP 2: ENGAGE WITH ASM TO UNDERSTAND THEIR CONCERNS AND RECORD RESULTS**

Through site and community visits as well as consultation with existing information, tin producers may design and undertake a baseline study to document health and safety risk awareness and practices among main project beneficiaries.

2. Conduct a [Behavior Analysis](https://asm-sector.org/) of miners at the selected ASM sites and producers towards health and safety issues at ASM sites. The behavior analysis will strive to understand the current types of knowledge, attitudes, and practices of ASM miners regarding OHS issues. The analysis could include:
   - ASMs knowledge and perception of risk
   - Behavior change incentives and disincentives
   - Communication approaches and strategies

**STEP 3: ENSURE EXPECTATIONS OF THE INTERNATIONAL BUYERS ARE MET**

Strive for alignment with the relevant International Frameworks, including:

- [International Tin Code of Conduct: Principles and Standards of Practice](https://www.asm-sector.org/)
- [International Tin Code of Conduct: Statement of Values](https://www.asm-sector.org/)
- [RMI Risk-Readiness Assessment](https://www.asm-sector.org/)
- [CRAFT Code of Risk-mitigation](https://www.asm-sector.org/) (Refer to pages 53-54 for basic health services and plant & protective equipment)

If previous baseline studies have been conducted, build on those to further understand priority OHS risks. For example, compare the findings to a categorized risk identification standard. In the context of Indonesia, an example can be found in PACT’s [ASM Occupational Health & Safety Guidance for Risk Management](https://asm-sector.org/).

Figure 2 on the following page, taken from the guidance, provides an overview of typical OHS risks within ASM mine sites, categorizing each risk by severity. Category 1 is the most severe and should be considered within the baseline study.

Figure 3 elaborates on these risks by providing technical response options and implementation suggestions, that can be used as a framework for all ASM mining sites. However, understanding that OHS responses are context specific and not ‘cut and paste’ is necessary in approaching this guide.
### Figure 2: Common Major OHS Risks Found in ASM Sites

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>TYPICAL PRESENTATION</th>
<th>RISK</th>
<th>RISK SEVERITY</th>
</tr>
</thead>
</table>
| High level hazards: Engineering & work practice controls | Landslides  
Tunnel or shaft collapses  
Rock falls  
Flooding of tunnels  
Equipment failure of winches and other items on which security depends  
Unsecured waste facilities such as slag heaps or tailings dam  
Abandoned pits or shafts are not clearly signed, present hazards if overgrown with vegetation or at night, etc. | Severe injury | 1 |

### Figure 3: Technical Responses Available for Common OHS Site Issues

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>RESPONSE OPTIONS</th>
<th>IMPLEMENTATION SUGGESTIONS</th>
</tr>
</thead>
</table>
| High level hazards: Engineering & work practice controls | Benches (to prevent landslides, which are a chief safety concern and the largest cause of miner fatalities onshore in Indonesia and, most likely, Myanmar). Steep areas that are not benched are generally at higher risk of collapse after heavy rains. | Mine bosses should be taught about why slope stability and benches are important and how they can be constructed and maintained. Slope stability and benches will help prevent landslides.  
The following steps should be taken:  
1. Implementation of operational benches check list, which consists of simple questions and/or drawings that may indicate the hazard of slippage in advance when fulfilled in the field by the operators.  
2. Replace the dredge for SME (surface mobile equipment), such as shovels, trucks and tractors. |

### STEP 4: DESIGN ENGAGEMENT AND WORKPLANS IN CONSULTATION WITH THE ASM AND COMMUNITIES

Tin producers may review the risks associated with the baseline report with the artisanal miners and / or communities and prioritize areas for improvement.

Tin producers, ASM and / or communities should develop an OHS work plan in accordance with the prioritization of risks and areas for improvement. This workplan plan may include areas for external support from government agencies.

This is a key step in creating buy-in and commitment from all stakeholders to improve OHS conditions. The action plan will clearly define roles and responsibilities for producers, ASM, and any external partners to improve OHS conditions on sites.
**PHASE III: IMPLEMENTATION**

**STEP 1: IMPLEMENT TECHNICAL CAPACITY BUILDING**

Build capacity and strengthen ASM through regular training, coaching, and mentoring. Initial training should include behavioral change training. For tools and templates for training, refer to the following links derived from the TWG pilot Project.

**STEP 2: IMPLEMENT BEHAVIORAL CHANGE**

In addition to providing technical assistance, the trainings may incorporate behavioral change methods, which is a fundamental driver in creating lasting OHS improvements. External expertise may be required to develop effective behavioral-change approaches. Behavioral change begins with altering perceptions on how miners approach health and safety related issues. Suggested OHS improvements may differ from traditional or cultural practices, or imply additional financial costs. It is therefore important to help miners understand how improved OHS practices can benefit their well-being.

Trainings may also include technical assistance to increase efficiencies in the miners’ production methods, so as to provide additional incentives for safer practices.

A key aspect for the success change in behavior is the need for regular engagement and follow-up through the form of routine site visits. Regular visits by the tin producer and/or implementing partners serves to develop mutual trust between the ASM and producers and enhances the effectiveness of collaboration.

Trainers should be creative in disseminating information about ASM related OHS issues. Some suggestions include:

- Laminated posters that utilize imagery in the local language(s) to reinforce key OHS messages;
- Exercises where a drawing is used as a discussion tool for group discussions. On the back of each drawing are the key discussion points and safety messages to be reviewed;
- Mobile-text systems to warn of upcoming rain or lightning storms and send pertinent safety reminders;
- Community radio to discuss issues such as safe mining practice;
- A demonstration/“model mine” with improved shelter and signage in place.

<table>
<thead>
<tr>
<th>Table 1: Standard Operating Procedures &amp; Tools available in Bahasa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Emergency procedures</td>
</tr>
<tr>
<td>2. Safety posters</td>
</tr>
<tr>
<td>3. Emergency equipment</td>
</tr>
<tr>
<td>4. Emergency phone numbers</td>
</tr>
<tr>
<td>5. Accident investigation report form</td>
</tr>
<tr>
<td>6. First aid procedure</td>
</tr>
<tr>
<td>7. First aid matrix</td>
</tr>
<tr>
<td>8. Excavator safe use procedure</td>
</tr>
<tr>
<td>9. Excavator maintenance procedure</td>
</tr>
<tr>
<td>10. Excavator daily checklist</td>
</tr>
<tr>
<td>11. PPE procedures</td>
</tr>
</tbody>
</table>
GENERAL CONSIDERATIONS IN IMPLEMENTING IMPROVED OHS PRACTICES


Legality and Government Engagement
In many ASM countries, including Indonesia, the members of local and national governments are important and influential stakeholders in the upstream supply chain. They need to be engaged in a transparent manner on a regular basis. It is important to ensure that proper procedures are followed to engage government, since cultural communication styles and hierarchies vary from place to place. Collaborate and coordinate with government regulatory services, such as the Mining Inspectorate to increase their knowledge and capacity to adequately monitor the mining areas.

Gender Equality
It is important to bear in mind that female miners and service providers may play different roles to their male counterparts and may face challenges in terms of access, perceptions and discrimination. Likewise, health and safety impacts can differ between male and female miners, so the training curriculum needs to be cognizant of gender dimensions. Simple steps such as ensuring that protective equipment fits women (smaller boot sizes, appropriate overalls, etc.) are important. Inclusion of women in all aspects of mine operations and management is important, including in security and supervisory posts. Keep in mind that children’s access to mines should be limited.

Inclusivity
In all cases, it is important to recognize that ASM are busy people and that mining is a business, not a social project. Presentations should be respectful of their time, prompt and engaging, cognizant of prevailing education levels, on site or close to it or in a village meeting hall and tailored appropriately considering the contextual circumstances. Consideration must be given to the fact that miners have other responsibilities and calls on their time outside the mine, particularly women. To ensure that women can participate, trainings or other activities may have to be timed to accommodate other household/agricultural/childcare obligations. Training sessions should be no longer than half a day and should be targeted at building miner capacity to meet minimum and progressive OHS criteria for entrance into international supply chain.

PHASE IV: MONITOR & EVALUATION, AND SCALE

STEP 1: MONITOR ACTIVITIES AND MEASURE PROGRESS

After trainings are delivered, follow up with miners and producers on implementation of action plans. Issues that come up in implementing improved OHS practices can be resolved together between the miners and producers. Joint meetings of participating ASM groups and follow up site visits may be conducted as this might encourage ASM to learn from each other, thus improving implementation.

Additionally, capacity building projects should include the development and implementation of a comprehensive monitoring and evaluation plan for ASM sites to be tracked and measured. It is beneficial to re-emphasize the importance of regular engagement (i.e. routine site visits) as done in the training and behavioral change implementation phase. This engagement will assist in monitoring project progress more effectively.

STEP 2: SCALE TO OTHER SITES / COMMUNITIES

Once successfully implemented with the first group of miners, tin producers may consider scaling the efforts to include additional groups of miners and/or communities.

Above: These are types of OHS signs that tend to be universally understood and function as supplemental educational tools (and not tools outright). Local focus groups should be convened to confirm whether mine workers understand what the signs mean; if not, one may need to adjust signage design according to local understandings.
TWG PILOT PROJECT: CHALLENGES AND SOLUTIONS

Some of the challenges observed during the TWG pilot project include:

- If miners are ‘penalized’ or ‘punished’ they can simply sell their ore to other collectors requiring companies to therefore take a friendly approach. This makes the enforcement of new practices challenging.
- Protective plant equipment is not viewed as necessary and is even viewed as disruptive to the work routine.
- Small business entities (CVs) that hire miners do not want to invest resources in tools and safety equipment.
- Companies have limited personnel and cannot supervise all mines.
- Low levels of education among ASMs make it difficult for trainers to provide information.
- Miners’ income levels and general poverty levels mean that miners will require financial support from companies to implement some changes at the sites.
- Mine sites may operate only during certain seasons which could interrupt engagement and progress.

Potential solutions may include:

ASM individual/groups have a strong desire to maintain their own mining routines and techniques. Although several miners openly agreed to change their practices, when pressed further, they did not feel the need to invest in this effort. Therefore, to get miners to consider change, key OHS messaging must be framed in community-spirited language focusing on the concepts of joint-efforts and team-endeavors so that there is a collective good.

Community oriented concepts will be more easily internalized if framed in traditions and in cultural context. A consistent OHS message needs to be conveyed through other mechanisms such as village meetings and informal meetings between miners.

The communication material may also be designed to be delivered to individuals or small groups through informal means. ASM are accustomed to learning while doing. Therefore, the learning method that is most suitable for them is located outdoors where workplace discussions are supported by direct practice.

REFERENCES


TFT (The Forest Trust), 2018. Transforming Indonesian Tin Miners’ Occupational Health and Safety