Occupational Safety and Health in ASGM operations

A quick reference guide for implementers

Supported by: gef
Led by: UN environment programme
In partnership with: UNIDO United Nations Industrial Development Organization, UNDP, Conservation International

Core research team

Josephine Singo

Patience Singo

Yves Bertran

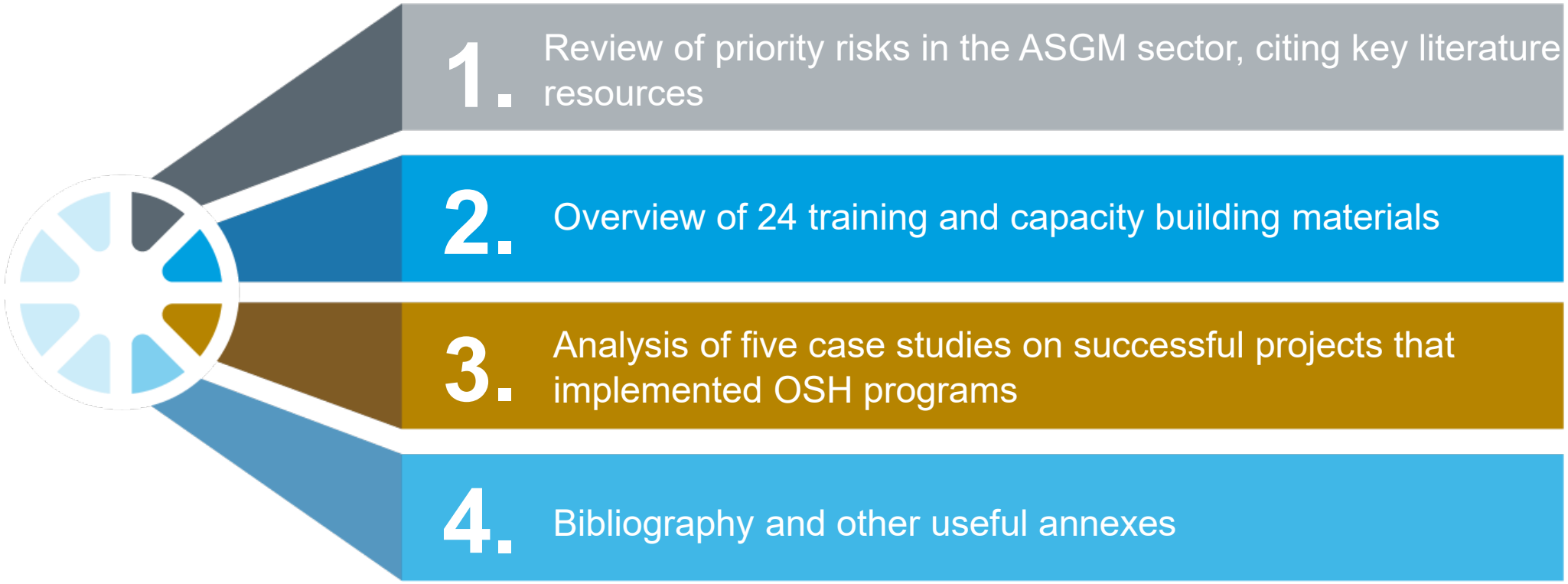
planetGOLD

Purposes of the Quick Reference Guide:

- Provide high-level understanding of risks present in the ASGM sector
- Summarize impacts and priorities that projects usually highlight or neglect on OSH issues
- Provide guidelines on gender-related issues on OSH and how to address them
- Learn from successful techniques and approaches to trigger behavior changes within the sector, at the training of trainers' and the miners' levels
- Provide a guide to dig further into specific topics, with internet accessible resources

planetGOLD

Contents of the Quick Reference Guide



Overview of OSH in ASM sector

Hazards, events, mitigations and management strategies

Introduction to OSH in ASM: key trends

planetGOLD

What is Occupational Safety and Health (OSH)?

Promotion of a safe and heathy working environment through prevention of workplace injuries and illnesses, and the protection of workers' rights.

Persistent OSH Challenges in ASM

- Unsafe working conditions
- Inherent informalities
- Lack of reliable data
- Compromised OSH effort
- Gender inequality

Source: Singo 2022

Hazards and risks

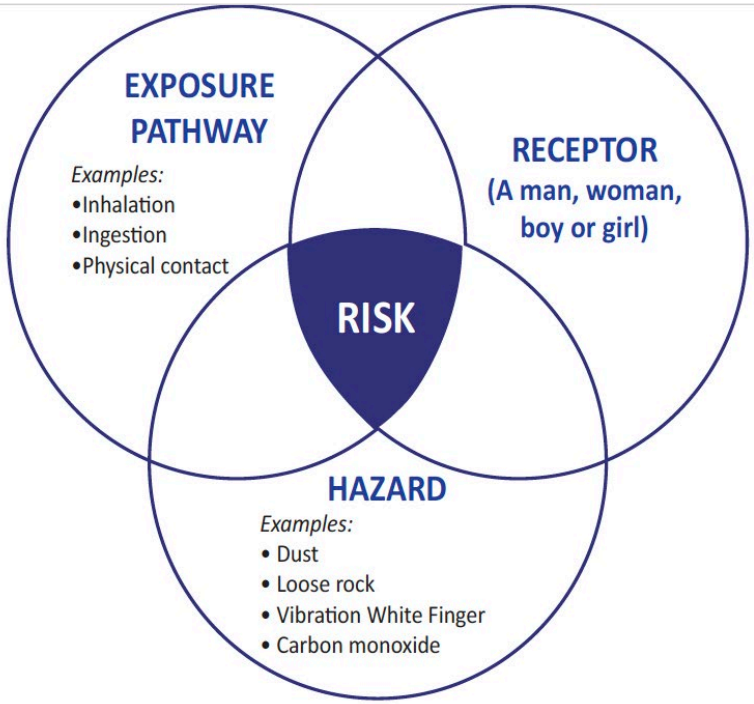


Figure 6-3: An occupational risk is created when (a) a hazard exists, (b) there are ways for a person to be exposed to a hazard (*exposure pathways*) and (c) a person is in a position to be exposed to a hazard.

Hinton, 2009 page 275, 277

Table 6-1: Example of a Hazard / Risk Analysis

LOCATION/ SITE	HAZARD	RISK OF OCCURRENCE/EXPOSURE		
		HIGH	MEDIUM	LOW
Crushing,	Dust	x		
Grinding		x		
Dry Drilling		x		
Wet drilling				x
Hauling				x

Classifying risks as high-medium-low will help you to **set priorities** (*identify those issues that urgently need to be corrected*). **Your actions to minimize and control hazards and risks should be based on high priority issues!** Do this analysis for all of the potential hazards and risks at your site.

Hinton, 2009 page 277

ILO, 2011 page 275, 277

Key OSH Risks	
Accidents/injuries	Injury rates 6-7 times higher than LSM Fatality rates as high as up to 80 per 100,000 workers
Toxics	Mercury Improper handling of cyanide
Respiratory disease	Silica dust exposure Tuberculosis
Infectious disease	Overcrowding, poor hygiene, and lack of sanitation infrastructure
Psychosocial	Alcohol and drug abuse, occupational stress, fatigue, injuries, accidents, and workplace violence
Environment	Abandoned open pits, stagnant water, chemically contaminated water, poor sanitation and deforestation
Ergonomic	Confined workspaces, repetitive work, heavy lifting, improper working positions

Figures (Table 2: Occurrence of Health Impacts from Occupational Exposures/Risks in ASM Page 33, 1a, Literature Review Report)

planetGOLD

Gendered OSH in ASM

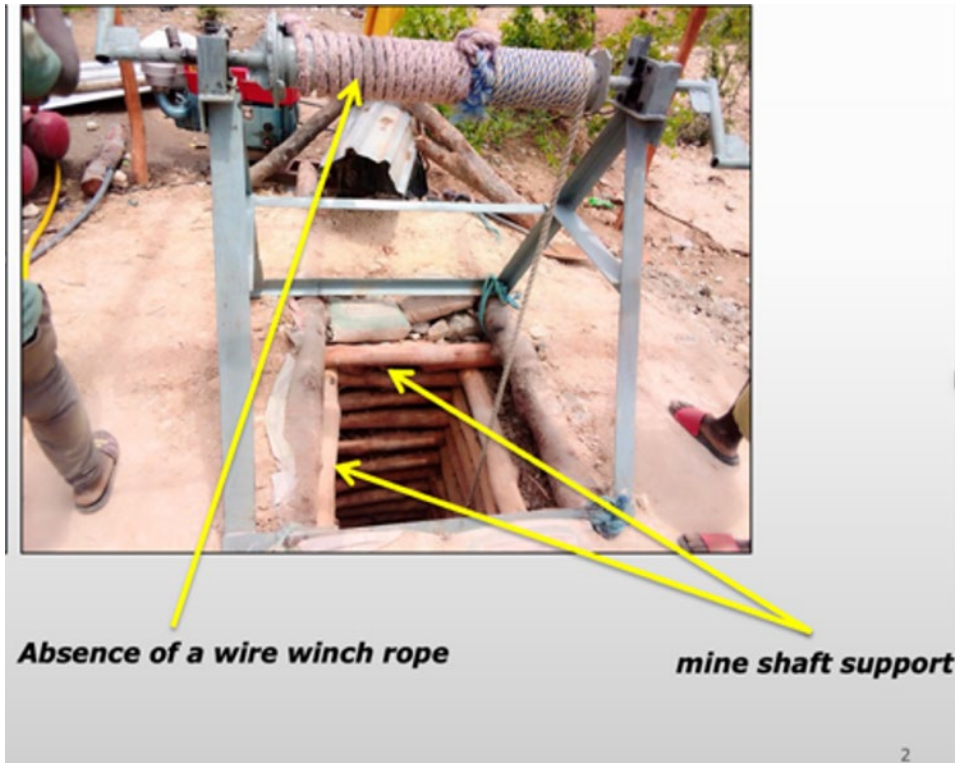
- Men-Fatalities;
- Silicosis 1.8 > men
- HIV 6% men : 10 % women
- Poor sanitation and hygiene
- Limited access to PPE and training among women

Mitigation Measures

Annex 1: OSH hazards and mitigations

Hazard(s)	Risks	Gendered impacts	Articles	Mitigation/Recommendations
Unsafe shafts				
Risk factors **· Unsupported shafts/poor mine support (poor ground control)** **· Shafts which are too close to each other** **· Under-cutting in surface pits.** **· Waste rock collapses** **· Overburden at the top of the shaft.**	Mine collapses · Injuries · Cuts ·Disabilities · Death	· Men are most exposed as they work most in pits and shafts. · Women exposed to ground collapses from waste dumps while scavenging ores.		· Appropriate distance between shafts · Constructing shafts on competent ground · Relevant mine support · Regular enforcement of relevant safety measures · Use of PPE to protect against rockfalls · Risk assessment; · Accident reporting and mitigating causes of accidents

planetGOLD


Absence of a wire winch rope
mine shaft support


wire winch rope
shafts too close

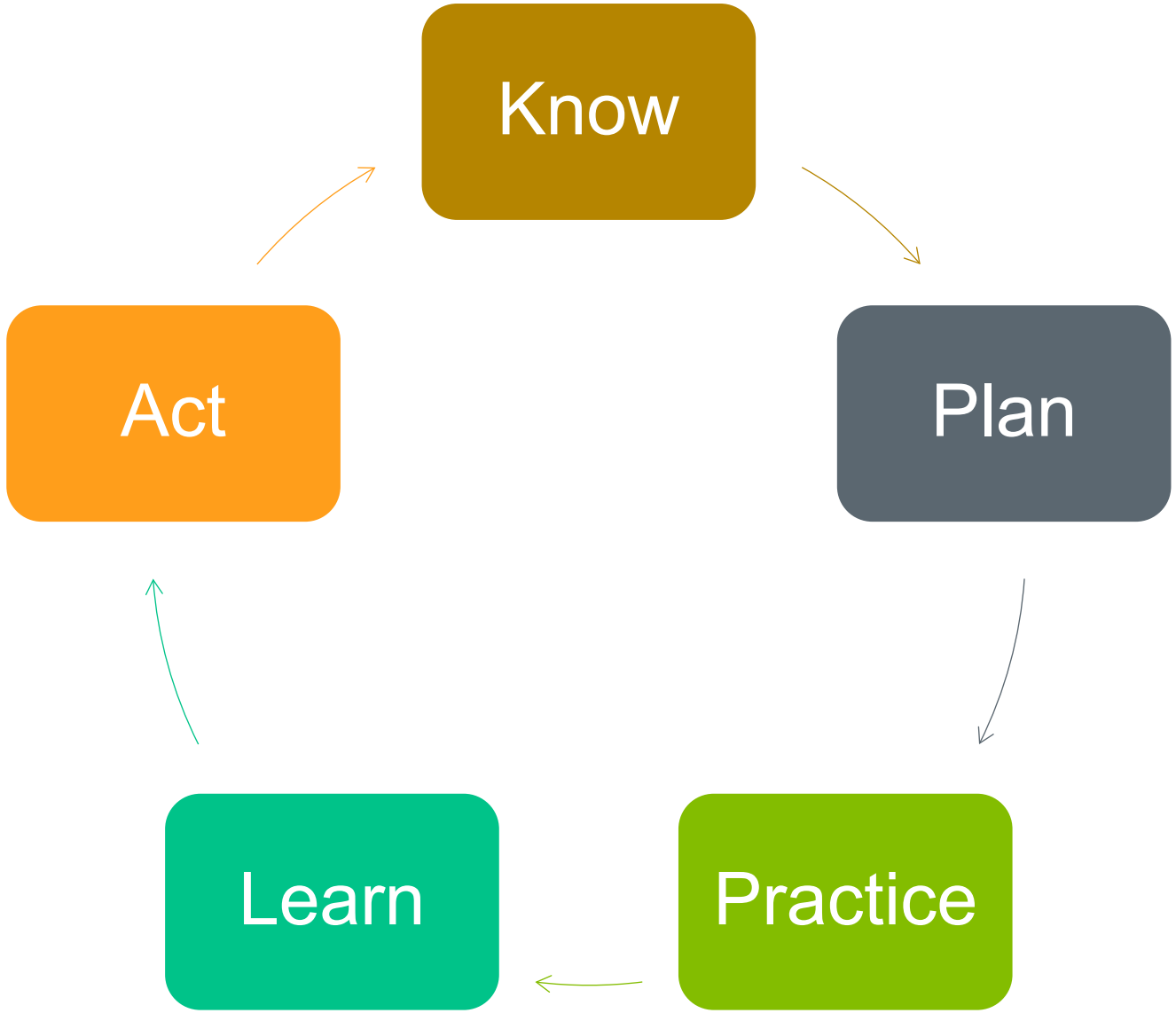
planetGOLD

Management of OSH in ASM

- **Compliance** : Regulations, Standards, Policies: relevant local, national, and international levels.
- **Risk Management:** Involves identifying, assessing, and controlling risks associated with workplace hazards.
- **Education and Training**: Emphasizes the importance of training workers on safety practices, emergency procedures, and their rights.
- **Employee Involvement**: Encourages participation from workers in safety programs and initiatives to foster a culture of safety.
- **Monitoring and Evaluation:** continuous assessment of workplace conditions and safety practices to improve and adapt strategies.

Key on-site OSH Management Practices

- Defining OSH Roles (management and workers)
- Onsite OSH Policy
- Risk assessment and management
- Accident reporting and investigation
- Onsite safety and health training
- Safety talks
- Gender inclusivity



planetGOLD

Management of OSH in ASM (con't)

PPE least effective protective measure

Integration of protective measures, shaft support, safety talks, mine entry procedures, PPE

"PPE alone cannot stop a rock fall".

- Dust
- Noise
- Unguarded Equipment

planetGOLD

Key recommendations

- **Gender-Responsive OSH Policies:** Develop and put into effect rules that address the unique dangers faced by women
- **Capacity Building and Training:** Give specialized instruction on OSH best practices, hazard identification, risk assessment, and PPE use. For instance, the Tinga Project by Women in Mining Ghana.
- **Mercury-Free Practices:** Encourage the use of mercury-free methods
- **Strengthened Regulatory Frameworks:** Work together with governments to implement licensing requirements and OSH regulations.

Find more recommendations in the Quick Reference Guide

Overview of OSH Training Materials

24 summaries on existing and accessible training and awareness raising material

planetGOLD

Content of the 2-page summaries

- General description of the project and the context
- Target audience of the training material
- A short analysis of the methodologies and approach
- Types of risks that are mentioned
- Specific methodologies that have been developed **for general and for gender-related OSH risks**
- A review of what is well-developed and what is missing

planetGOLD

Summary example

Memo 1: Good mining practice handbook for small-scale primary gold mining sector

Identifying Information	
Authors	Budi Sulistijo
Document title	Good mining practice handbook for small-scale primary gold mining sector
Date of publication	2021
Implementing/financing institution	GOLD-ISMIA – planetGold Indonesia
Country of implementation	Indonesia
Language	English
Full citation *(Harvard style)*	Sulistijo, Budi. (2021) Good mining practice handbook for small-scale primary gold mining sector. Bandung, Indonesia: GOLD-ISMIA Project, p. 142. Available at: https://www.planetgold.org/sites/default/files/REV%20-%20Good%20Mining%20Practice%20Handbook_compressed_0.pdf (Accessed: 4 September 2024).
Link to publication *(URL or DOI link)*	https://www.planetgold.org/sites/default/files/REV%20-%20Good%20Mining%20Practice%20Handbook_compressed_0.pdf
Resource description	
Type	Handbook
Main objective	Promote technical level of mining safety and environmental management. The contents of this book are based on the conditions of small-scale primary gold mining in Indonesia.
Description	The handbook is a technical guide to apply good mining practices in the underground artisanal gold mining. It is not meant to be a a handbook on occupational safety and health but contains detailed description on safe practices regarding building underground infrastructures (tunnels and shafts), excavation and hauling methods, ventilation, lighting, communication and dewatering. It also addressed practices regarding ore processing, with advice on good practices regarding mercury and cyanide-free methods, and smelting.

planetGOLD

Two tables compile the summary results to facilitate navigation

- Identify summaries that tackle specific risks and methodologies
- Find the type of support material developed: booklet, handbooks or presentations
- Find material developed in English, French or Spanish
- Quick link to the corresponding summaries
- Overview of the most frequent risks addressed in the support material
- A selected menu of the best practices to use for developing specific training approaches on OHS

planetGOLD

Direct links to the summaries

Summary table

Table 2. Set of training materials analyzed

#	Author/date	Title	Resource Type	Best for
1	Sulistijo, B. (2021)	Good mining practice handbook for small-scale primary gold mining sector	Handbook	Description of safe mining practices and techniques
2	planetGOLD Mongolia (2021)	"ASM OSH training" for artisanal and small-scale miners	Training curriculum	Training for miners on basic approach to OSH risk management
3	Kroll, M. (2024)	Addressing mercury and other hazards in the artisanal gold mining sector through public health interventions: A handbook for health professionals	Handbook	Resource about ASGM and health, targeted to health care providers
4	Forst, L. (2024)	Occupational Safety and Health (OSH) in Artisanal and Small-Scale Gold Mining	Training	Overview of occupational health issues, primarily related to mercury
5	PanAfGeo/ Tychsen, J. et al. (2017-2018-2019)	ASM handbooks for Zambia, Ghana and Malawi with Regional perspectives	Handbooks	Broad background on OSH issues for general knowledge
6	PanAfGeo/ Charles, N. and Tychsen, J. (2019 and 2023)	ASM guides in francophone Africa	Guide (FR and ENG)	Description of hazards and general recommendations to reduce exposure or to mitigate risks
7	planetGOLD Indonesia (2021)	Guideline for Gender Mainstreaming in the Artisanal and Small-Scale Gold Mining Sector (ASGM)	Handbook	General framework for gender mainstreaming in ASGM, with some reference to gender-specific OSH risks (e.g. mercury exposures)
8	Todd C. and Glasgow, R. (2015)	Occupational Health & Safety in Small and Medium-scale Mining	Training	Technical training on equipment
9	planetGOLD Kenya (2022)	ASGM Training Manual	Training curriculum	General background on OSH issues, but does not cover all risks
10	Pact (2019)	Training Handbook for Artisanal and Small-Scale Miners in Zimbabwe	Training handbook	Overview of OSH

planetGOLD

Direct links to the summaries

Navigation table

Publication number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	occurrence
Type of publication																									
Report							x																		4 %
Research paper																									0 %
Public policy and legislation																									0 %
Statistics																									0 %
OHS management system		x																							4 %
Handbook/guide	x		x		x	x				x	x	x	x			x	x	x	x		x			x	58 %
Regulation																					x				4 %
Training material		x		x				x	x	x				x	x							x			33 %
Note																				x			x		8 %
Video/image																									0 %
Primary target audience																									
Miners and mine operators	x	x					x	x		x	x	x	x			x	x	x	x	x	x	x	x	x	71 %
Trainers	x				x	x		x	x	x				x	x	x				x			x		46 %
Administration staff, mining and health public officers	x		x	x	x	x	x			x				x	x										38 %
Types of hazards																									
Physical																									

OSH in practice

A compilation of 5 case studies

planetGOLD

A detailed review of projects that implemented successful OSH training programs

- Project context and OSH issue formulation
- Objectives of the training material: target audience, mining context
- Methodology for implementation of the training program
- Outcomes and impact of the program
- Success stories and challenges
- Lessons learned
- Scalability and replicability potential

planetGOLD

Various mining, national and linguistic contexts

1. Somos Tesoro project in Colombia
2. PROMINES project in DRC
3. Fair gold supply chain project in West Africa
4. Sustainable artisanal mining project in Mongolia
5. Impact Transform training videos for West Africa

planetGOLD

Main lessons learned

- Incorporate training programs into the formalization process
- Address gender aspects
- Emphasize knowledge transfer
- Include strong communication and monitoring
- Balancing safety and costs in OSH implementation

Thank you.

planetGOLD

Supported by: gef

Led by: UN environment programme

In partnership with: UNIDO UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

UNDP

CONSERVATION INTERNATIONAL