

# Best Practices



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*Lao PDR, 2003*

# Definitions



The term artisanal & small-scale miners (ASM) encompasses all small, medium, informal, legal and illegal miners who use rudimentary processes to extract gold and other minerals from secondary and primary ores



*Zimbabwe, 2003*



# Numbers



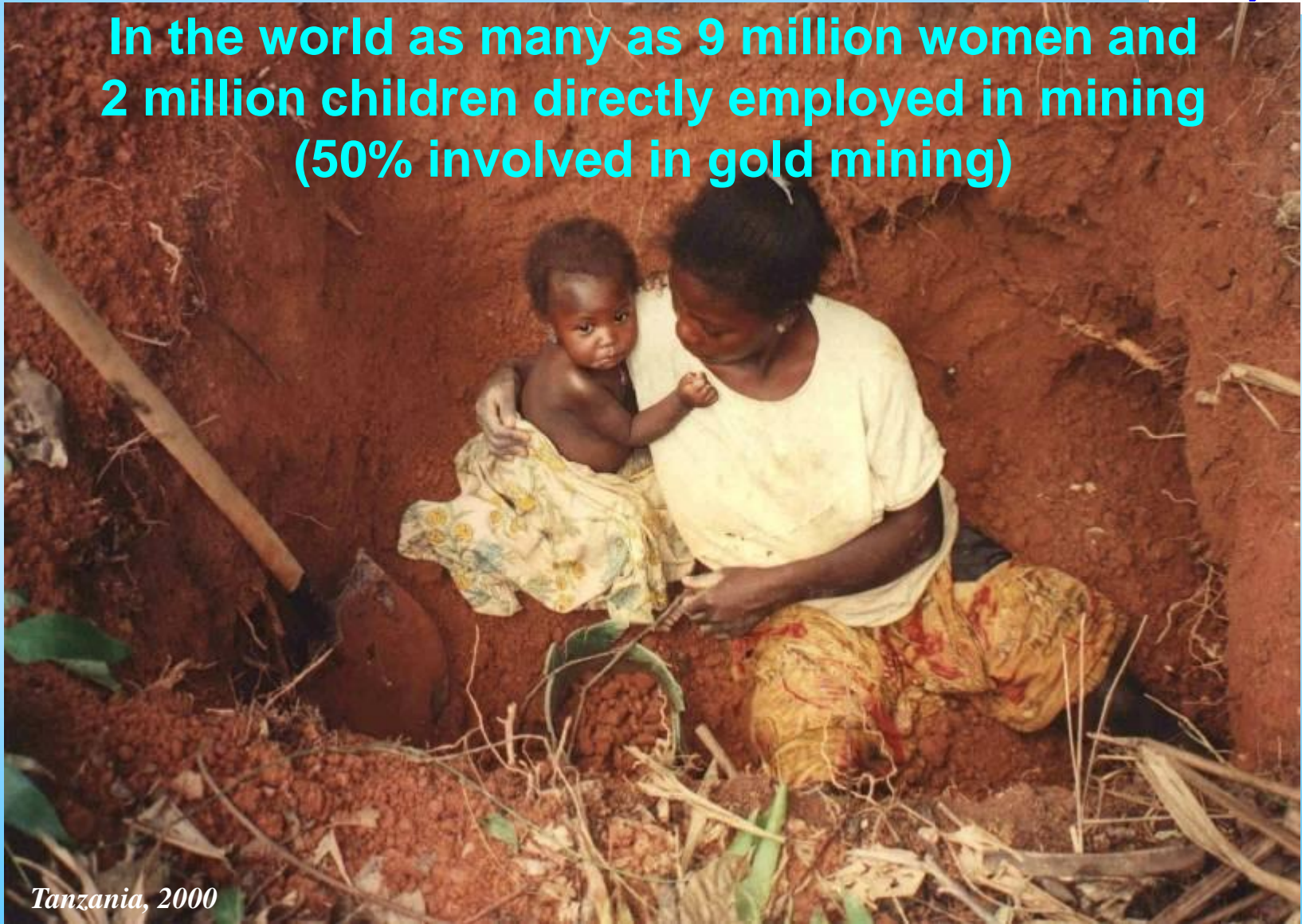
**About 30 million artisanal and small-scale miners (ASM) extracting more than 30 minerals from secondary and primary ores in virtually all developing countries**



# Numbers



In the world as many as 9 million women and 2 million children directly employed in mining (50% involved in gold mining)



*Tanzania, 2000*



# Definitions



**This is the biggest gold rush the world has ever seen**

- **15 million artisanal miners producing 300-400 tonnes Au/a in 70 countries**
- **About 50 million people directly and indirectly involved in artisanal gold mining**



*Guinea, 2006*

# Causes of poor practices



- Disorganisation & Transience
- No technical assistance
- Lack of education
- Inadequate Regulations
- Financial Barriers
- Lack of Support from Mainstreams of Society
- **POVERTY**

*Tanzania, 2000*



# Environmental Problems Caused by Artisanal Gold Mining



- **Water siltation**
- **Landscape degradation**
- **Destruction of habitats**
- **Loss of organic soil**
- **Deforestation**
- **Mercury pollution**



# Why Mercury in ASM is a Problem?



- **Worldwide  $>1,000$  t/a Hg is used and lost by artisanal miners or 1/3 of the global Hg consumption for all uses (total Hg use for chlorine, batteries, catalyst, dental, lightning, etc. = 3,290 tonnes/a)**
- **Miners who use mercury and community members suffer severe neurological problems**



*Indonesia, 2005*



# Miners Are Not Aware of the Dangers of Hg



- Water is also used for fish farming, drinking, bathing.
- Mercury is freely available, used in the miners' backyard



*Galangan, Kalimantan, Indonesia*



*Zimbabwe, 2005*

# Solutions Being Introduced



***Reduction of  
Hg Use and  
Emissions***

***Replacement for  
Amalgamation***

**Avoid bad  
practices and Hg  
exposure**

**Use other  
process (e.g.  
Cyanidation)**

**Short-term**

**Long-term**

# Ore Processing

## *Bad practices*



- Whole ore amalgamation





# Ore Processing

## *Bad practices*



- **Copper plate amalgamation**



# Ore Processing

*More efficient and better practices*



- **Concentration of the ore**





# Ore Processing

*More efficient and better practices*



- **Controlled amalgamation**





# Amalgam burning

## *Bad practices*



- Open air retorting



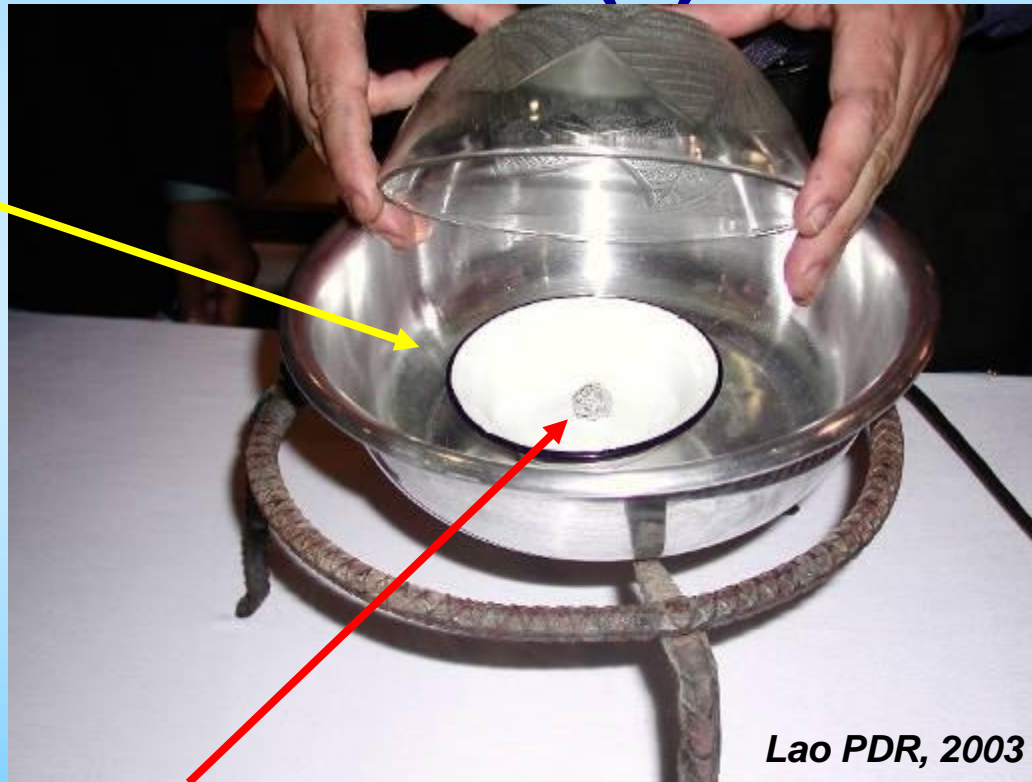
# Amalgam burning

## *Good practices*



- **Locally made retorts (1)**

wet sand  
is added  
to seal



**Gold comes yellow as amalgam  
has contact with enameled dish**

# Amalgam burning

## *Good practices*



- **Locally made retorts (2)**



*Lao PDR, 2005*



# Problems faced



## Education/Training is not Trivial

- **Miners cannot afford to stop their activities to “be educated”**
- **Miners learn by example**
- **Miners must decide what is good or not for themselves...not us**
- **Miners move from one site to another**
- **We need to spend more time with the miners**

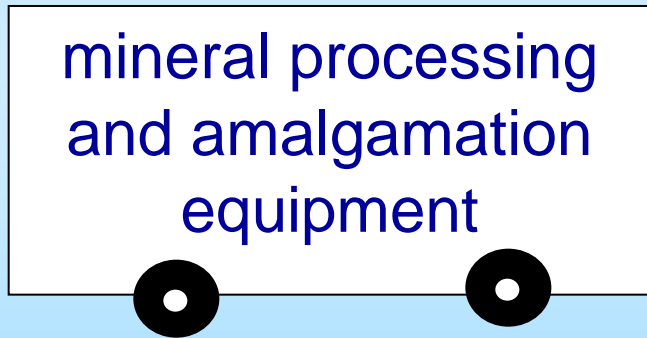
# Solutions



Reaching out to the miners is essential

## What is a TDU ?

*container, truck or trailer*

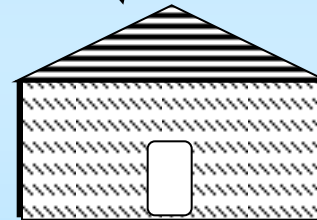


educational theater

technical trainer

personal protective equipment

hands-on training



brochures

Hg Lab with LUMEX

classroom

audio-visual

 health trainer/nurse

**SOLUTIONS**

# Training the Trainers



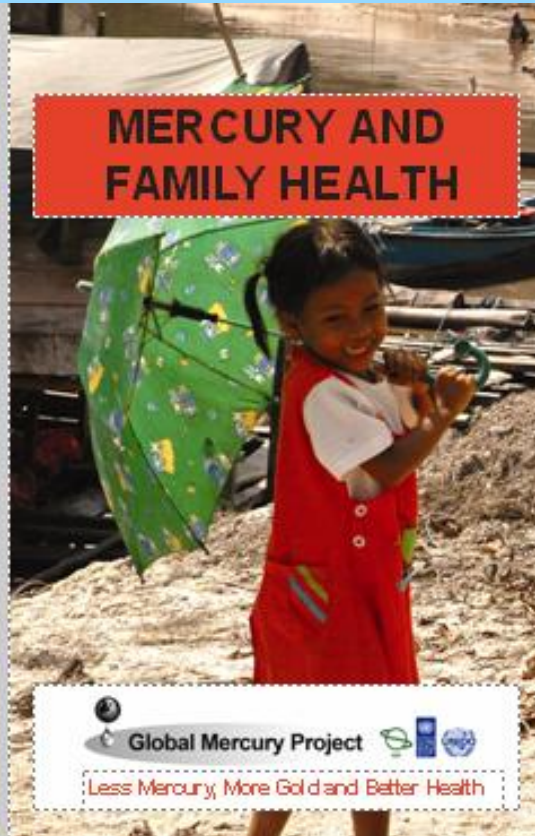


**PROTECT YOUR  
CHILDREN'S FUTURE**



**BURN MERCURY FAR AWAY  
FROM WOMEN AND  
CHILDREN**

**MERCURY AND  
FAMILY HEALTH**



 Global Mercury Project     
Less Mercury, More Gold and Better Health

**Awareness  
Campaign  
Focused on  
Groups at Risk**

# Conclusions

- Important to introduce immediate MEASURES to reduce mercury exposure and emissions
- Actions must be bottom-up and top-down



*Brazil, 2007*

*US EPA fume hood for gold shops*



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