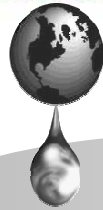




Green Industry



Global Mercury Project



The Global Mercury Project: Summary of results



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

www.unido.org



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Artisanal and Small-Scale Gold Mining - The Problems

- Water Siltation
- Land degradation
- Destruction of habitat
- Loss of organic soil
- Deforestation
- **Mercury pollution**



Indonesia, 2005



Indonesia, 2002



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Artisanal and Small-Scale Gold Mining

- Why mercury is a problem

- Worldwide more than 1,000 tonnes of mercury are used annually by the sector (about 1/3 of all human use)
- Mercury enters water courses and becomes a transboundary pollutant

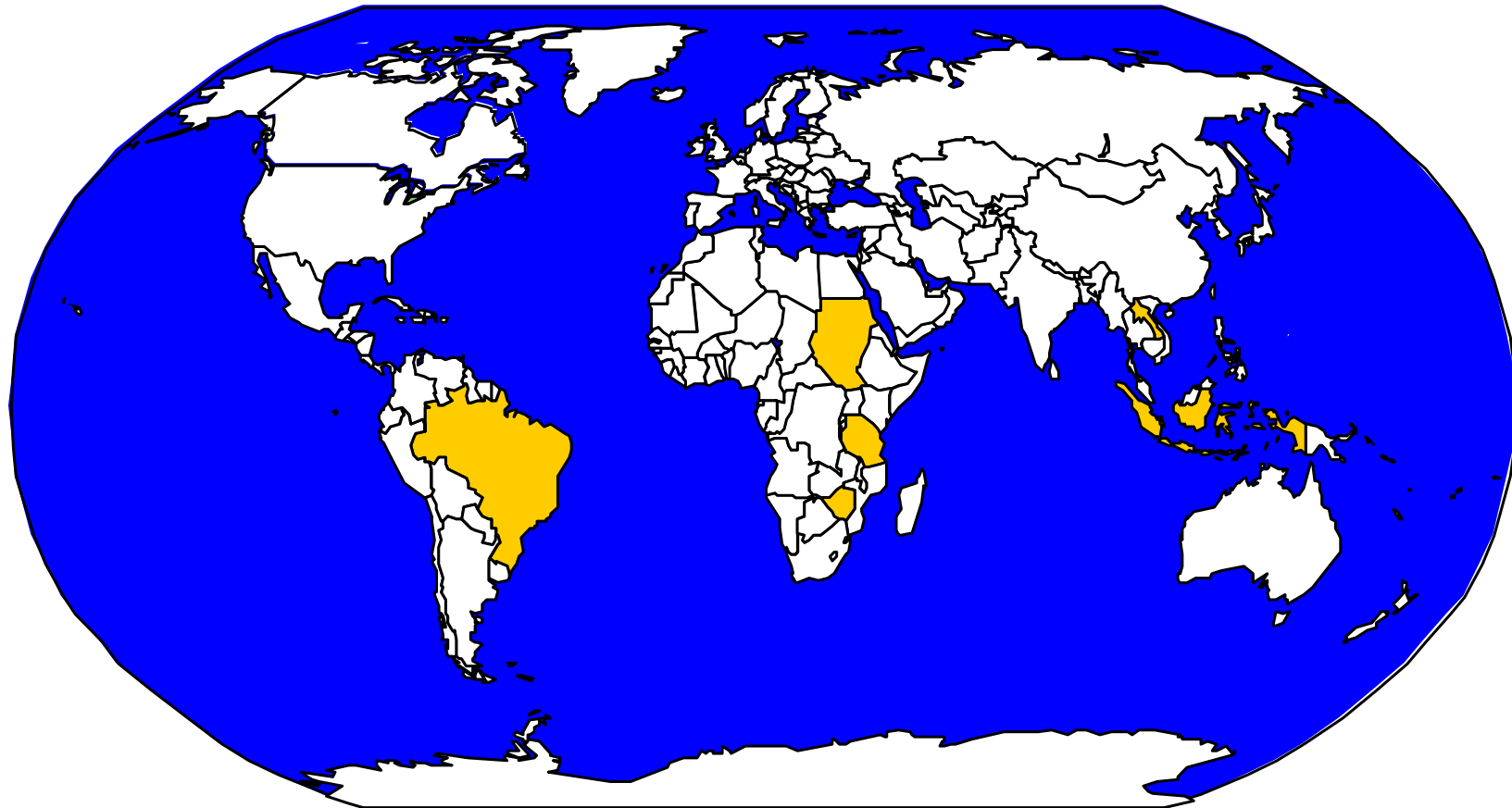


UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project - Global Coverage





UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project

- Objectives

- Environmental, health & socio-economic evaluation
- Create policies to insert artisanal mining into the formal society; suggest legislations
- Education of miners and communities
- Improve gold recovery; building equipment
- Reduce mercury exposure and emission
- Evaluate mercury mobility in water streams



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project - Results - Environmental findings (1)

Two main sources of mercury emissions



*Miner burning amalgam in
an open pan*



*The whole ore is amalgamated using
a Copper plate*



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project – Results

- Environmental findings (2)

- Mercury does not stay in water, it sediments and gets transformed into methyl mercury
- Use of dredges increases water siltation and mercury transportation
- Amalgamation of the whole ore is the main cause of mercury pollution of water systems
- Methyl mercury concentration is high in fish samples
- Cyanidation of mercury contaminated tailings exacerbates mercury mobility and its methylation



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project - Results

- Health findings

- High levels of mercury in lungs and urine of miners in all pilot countries (exposure to vapour)
- High levels of neurological problems in miners and people living around the mining operations
- Mercury is released in gold shops, at the refining stage



Brazil, 2005



Indonesia, 2005



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project - Results

- Policy changes

- Extensive mining legislation review was undertaken in each of the countries
- Advise on legislation update was made on a case-by-case basis
- New mining legislation have since been voted in Indonesia, Laos, Sudan and Tanzania
- International Guidelines on mercury Management have been developed



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project - Results - Education

- Education approach were developed according to the local conditions (e.g. theater play in Zimbabwe)
- Education was focused on the group at risk





UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project - Results - Gold Recovery

- Technology transfer based on the Train-the-(local)Trainer
- Implemented by local NGOs
- Transportable demonstration units to reach more sites



TDU in Tanzania



On-site demonstration



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project - Results - Reduce Mercury Exposure

- Make the use of retort (locally made) compulsory
- Install fume hood at gold shops (with USEPA)
- Recycle mercury



Brazil, 2006



Zimbabwe, 2005



Brazil, 2007



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project - Results

- Reduce Mercury Emissions

- Introduction of locally-made gravimetric concentration tools
- Forbid working on river banks



Sluice box



Centrifuge



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project – Results

- More than 100 trainers trained in new technologies, their use and how to build them locally
- More than 30,000 miners trained, more than 25,000 community members sensitized on problems posed by the sector and their solutions
- 15,000 brochures distributed, 75 media reports, 9 publications in international journals, 3 chapters in books, 2 books, 37 papers in conference proceedings
- Online database (350 articles, photos, reports, available on www.globalmercuryproject.org)



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project – Results

- **6 international water basins of significance benefit from reduced pollution:**
 - **Amazon River**
 - **Java sea**
 - **Mekong River**
 - **Nile River**
 - **Lake Victoria**
 - **Zambezi River**



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project – Lessons learnt

- Each ASM location is unique in its climatic, geologic, cultural and political differences, technological solutions have to be adapted and interventions must be flexible according to the site
- Interventions must be supported by the national, provincial and local governments (in cash and in action)
- To make intervention successful, working with the miners for extended period of time is essential
- Regional projects foster more synergies between participating countries



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project – the way forward

- Artisanal and Small-Scale Gold Mining occurs in 60 countries
- The price of Gold is still rising, attracting more and more people
- 35 countries have requested UNIDO's assistance
- UNIDO has develop a strategy to address the sector holistically



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project – the way forward

- Mercury emissions from the sector are set to increase
- Water streams need to be protected as they are the main recipient of mercury releases from the sector
- In 2013 a legally binding agreement on mercury will be in place, **we need to act now** to offer an alternative to amalgamation to the 15 million miners currently using mercury



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Green Industry

Global Mercury Project – the way forward

Thank you for your attention