



Global Mercury Project



NEXT PHASE OF THE GMP

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Outline

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- Scope of the Divisions: 2. Awareness Campaign
- Scope of the Divisions: 3. Results and Policy Development
- Scope of the Divisions: 4. Risk Assessment and Reclamation Strategies
- Scope of the Divisions: 5. Media Relations
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About ASM – Artisanal and Small-scale Mining

ASM Needs to Be Put into a Context

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



Zimbabwe, 2003

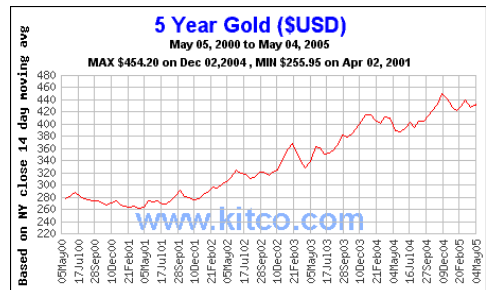
Artisanal and Small-Scale Mining (ASM)

The way of working makes the difference between Conventional and Artisanal Mining

Conventional	Artisanal
geology, drilling	feeling, testing
reserves	subsistence
engineering	curiosity, pay bills
sophisticated equipment	homemade devices

Gold ASM is Growing

Gold price increasing = More people involved



Gold ASM

- Number of ASM have increased notably in Asia and Africa and reduced a bit in Latin America
- In China: 3 to 15 million miners ...depending on how ASM is defined (*Gunson & Veiga, 2002*)
- Best guess: 20 to 30 Million ASM (50% involved in gold) in more than 55 countries
- More than 1000 tonnes/a Hg released by ASM worldwide
- This represents 1/3 of the anthropogenic Hg emissions

42% of the people in Sub-Saharan Africa makes US\$ 1/day



Women in Artisanal Mining

- Approximately 30% of the world's artisanal miners are women
- 15 to 20% of ASM in Latin America are women
- 30 to 40% in Africa
- 10 to 20% in Asia

Sources:

- MMSD (2002)

- Hinton, Veiga and Beinhoff (2003)



Brazil, 1997

Women in Artisanal Mining



Venezuela, 1995



Tanzania, 2001



Indonesia, 2003

In the world this can represent as much as 9 million women directly employed

Mining & Child Labor

ILO (1999) estimates 250,000 working children in ASM



Suriname, 1996

Mining & Child Labor

...currently this can be > 2,000,000 children (ILO, 2004)



Laos, 2003

Facts

- ASM is the main environmental and social problem related to mining activities in developing countries
- Most people in developing countries become miners to escape complete social marginalization
- Governments are generally not prepared to deal with issues related to artisanal mining
- In many rural regions, artisanal mining is an island of "prosperity" in a sea of poverty

Mercury is just the Tip of the Iceberg

visible villain



- Mercury Pollution
- Environmental Impacts
- Degradation of Socio-Economic Conditions
- Health Impacts
- Lack of Economic Alternatives

Mercury is just the Tip of the Iceberg

- Disrespect for cultures (conflicts)
- Degradation of moral values
- Drinking and drug problems
- Illegal activities
- Money laundering & smuggling
- High cost of living in mining villages

Causes of Poor ASM Practice

- Disorganization & transience
- Lack of proper training
- Depletion of easy ore (no technical assistance)
- Inadequate regulations
- Financial barriers
- Misconceptions
- Lack of support from mainstreams of society
- Hidden interests



Tanzania, 2000



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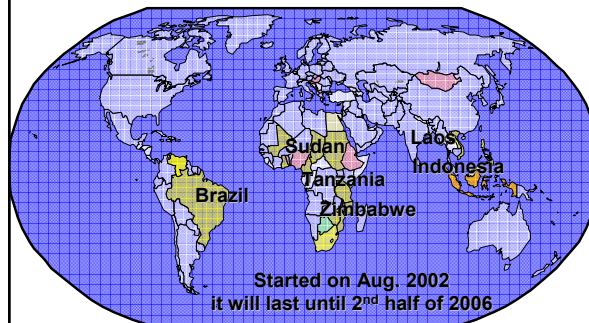
About GMP – Global Mercury Project

UN Millennium Development Goals

- 1) Eradicate extreme poverty and hunger
- 2) Achieve universal primary education
- 3) Promote gender equality and empower women
- 4) Reduce child mortality
- 5) Improve maternal health
- 6) Combat HIV/AIDS, malaria and other diseases
- 7) Ensure environmental sustainability
- 8) Develop a global partnership for development



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Origin of funds for projects:	US\$	%
Regular UNIDO Budget	130,000	2
UNDP	280,000	3
UNDP/GEF	350,000	4
Donor funding:		
Government of Austria	70,000	1
Government of France	250,000	3
Government of Japan	350,000	4
GEF Global Mercury Project (2002)	6,806,800	83
Total Budget since 1995:	8,236,800	100

What does the Global Mercury Project (GMP) aim to accomplish?

- Improvements in community health
 - Reduce mercury exposure
 - Miners and processors (women, men and children)
 - Families and vulnerable populations
 - Promote health seeking behaviors
- Improvements in community quality of life
 - Increase income
 - More gold; possible economic diversity
 - Promote sense of security (family and community)
 - Greater participation in formal economy
- Reduction and prevention of Hg contamination globally

Objectives of the GMP (as in the Project Document)

Objective 1A

Establishment of a UNIDO- based Program Co-ordination Unit (PCU) and a Global Project Task Force.

Objective 1B

Establishment of the programme management structures in each of the six participating countries (Brazil, Indonesia, Lao PDR, Sudan, Tanzania, Zimbabwe).

Objective 2

Identify project demonstration sites and organize training in technology and raising awareness of miners, Governments, NGOs and the general public.

Objective 3

Assess the extent of environmental (mercury) pollution in surrounding water bodies and devise intervention measures.

Objective 4

Establish a databank comprising technological requirements relevant to artisanal gold mining and extraction activities.

Objective 5

Demonstrate within the project demonstration sites, the application of affordable high-efficiency clean technology.

Objective 6

Develop country specific policies and legislation that will lead to implementable standards on the application of mercury.

Objective 7

Promote the dissemination of the produced project results and identify opportunities that will allow the project to continue beyond the three year time frame.

Summary of the Objectives of the GMP

- Objective 1:** organize
- Objective 2:** awareness
- Objective 3:** monitoring
- Objective 4:** databank
- Objective 5:** demonstrate
- Objective 6:** policy
- Objective 7:** dissemination

Completion of the Objectives

Objective	Objective completion (%) by April 2005					
	Indonesia	Sudan	Tanzania	Zimbabwe	Brazil	Lao PDR
1. organize	40	64	56	48	56	56
1. organize	20	44	24	52	76	64
2. awareness	20	34	26	31	29	14
3. monitoring	49	40	66	49	57	77
4. databank	16	40	8	36	48	36
5. demonstrate	0	6	0	0	6	26
6. policy	6	46	0	23	20	17
7. dissemination	0	35	20	5	10	5

Completion of the Objectives

Country	% of completion of project objectives by April 2005
Indonesia	21.3
Tanzania	24.7
Zimbabwe	30.2
Brazil	36.6
Lao PDR	37.0
Sudan	37.4

Summary

What Was Done and What Has to Be Done

- ✓ environmental and health assessment;
- ✓ build capacity in local laboratories to assess impact of mercury pollution;
- create awareness to reduce mercury pollution caused by artisanal miners on international waters;
- introduce cleaner technologies for gold extraction and train miners (demonstration sites);
- develop capacity and regulatory mechanisms within Government that will enable the sector to minimize mercury pollution.



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Next Steps of the GMP

What Has to Be Done (according to the Project Document)

Awareness Campaign
Scope:

- 2.4 - Organize awareness campaigns
- 2.5 - Conduct awareness programs through media
- 2.6 - Develop training/awareness material
- 3.6 - Building capacity in local labs
- 5.1 - Conduct training for miners
- 5.7 - Elaborate documentary videos



What Has to Be Done (according to the Project Document)

Transportable Demonstration Units
Scope:

- 2.3 - Assessment of miners' training needs
- 4.1 - Database on artisanal mining technology
- 4.2 - Infobase for local and foreign suppliers
- 4.3 - Identification of local facilities for fabrication
- 4.4 - Check tax regime on importation of equipment
- 4.5 - Develop micro-financing programs
- 5.1 - Conduct training for miners
- 5.2 - Conduct training for manufacturers
- 5.3 - Demonstrate and install demonstration units
- 5.4 - Demonstrate high-recovery gravity conc. equipm.
- 5.5 - Establish equipment supply channels



What Has to Be Done (according to the Project Document)

Results and Policy Development Scope:

- 6.1 - Literature review and database
- 6.2 - Review and compare indicators, regulations & policies
- 6.3 - Recommend indicators, regulations & policies
- 6.4 - Consult stakeholder about recommendations
- 6.5 - Develop guidelines on indicators and legislation
- 6.6 - Workshop on legislation
- 6.7 - Develop enforcement programs



What Has to Be Done (according to the Project Document)

Risk Assessment and Reclamation Strategies Scope:

- 3.7 - Formulate measures for "hotspot" remediation
- 3.4 - Establish extent of Hg migration from hotspots (model Hg migration using GIS techniques)
- 5.6 - Conduct (suggest) mercury immobilization; advise Governments on methods to adopt the remediation strategies



What Has to Be Done (according to the Project Document)

Workshop & Fundraising Scope:

- 2.7 - Assist Govts to improve institutional cooperation
- 7.1 - Workshops on gold extraction techniques
- 7.2 - Regional annual workshops
- 7.3 - Review opportunities for self-financing
- 7.4 - Organize donors' conference



What Has to Be Done Summary

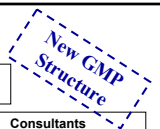
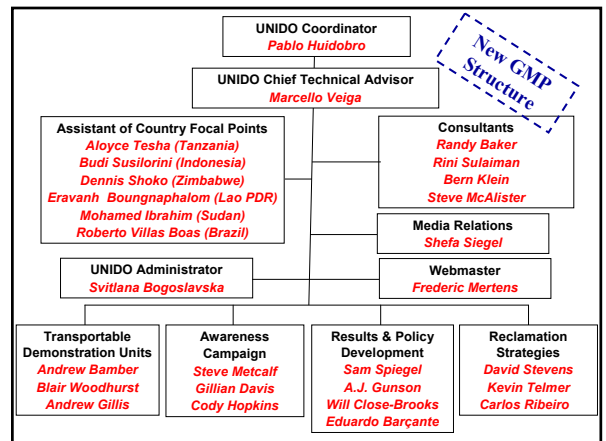
- ✓ First phase was environmental and health assessment
- Now it is time for **INTERVENTIONS**
 - Education of miners and communities
 - Higher efficiency gravity concentration
 - Reduction of Hg emissions and exposure



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New Structure of the GMP





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Scope of the Divisions: 1. Transportable Demonstration Units (TDU)

Education/Training is not Trivial

- Miners cannot afford to stop their activities to “be educated”
- Miners learn by examples
- Miners must decide for themselves what is good or not
- Miners are moving from one site to another
- Traditional demonstration units stay in place while miners move on
- GMP innovation: **Transportable Demonstration Units**

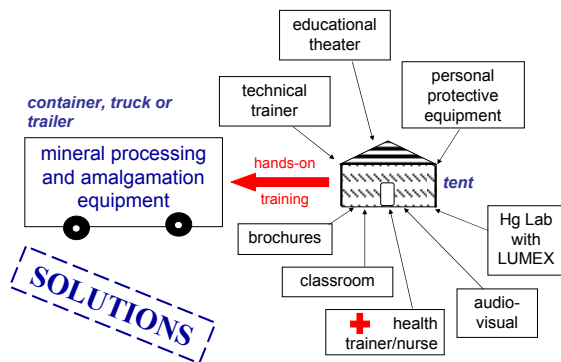
Transportable Demonstration Units (TDU)

1. cheaper to implement than fixed training centers
2. training units go to where the miners are
3. a variety of technical options demonstrated
4. easy to change and adapt new pieces of equipment
5. more miners and families can be reached
6. the ownership is easy to decide; no land or mineral title issues or conflicts

Transportable Demonstration Units (TDU)

8. further education: health & sanitation, bookkeeping, legal issues, etc) and awareness for non-miner communities
9. monitoring teams can make use of the units
10. the units can bring ideas to improve the livelihood of different mining communities such as suggesting economic diversification activities or value-adding techniques

Transportable Demonstration Units (TDU)



Transportable Demonstration Units (TDU)

Multi-purpose:

- Demonstrate a variety of technological options for comminution, concentration, amalgamation and retorting
- Pilot operations for training purposes
- Show best Hg practice
- Platform for Awareness Campaign Materials
- Environmental, health and safety functions
- Mineralogical and process evaluation

Process Equipment for Demonstration

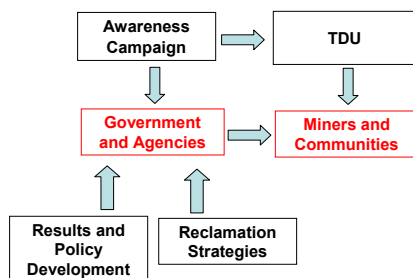
Design Criteria:

- Pilot scale equipment:
 - feed typically 50 kg batches
- Transport by pickup:
 - max dimension 1m, typically < 500kg
- Small electric power ~ 220V
- Equipment is easy to scale-up
- Suitable for local manufacture or in-house development

Selection of Equipment to Be Demonstrated

- Evaluated and approved by stakeholders
- Site-specific (depending on the degree of mechanization in each country)
- Equipment “per se” will not educate miners: **COMMITMENT** is needed

How the TDU Will Interact with Public



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Scope of the Divisions: 2. Awareness Campaign

Awareness Campaign

When people are stressed, it's really hard to adopt new behaviors - even if they want to.

Reducing stress on miners promotes real changes

SOLUTIONS

Stresses miners face

- Poverty
- Disease and lack of community health services
- Lack of legal tenure
- Dangerous work conditions
 - Cave-ins
 - Landslides
 - Process chemicals: mercury and cyanide
 - Dust and noise

Ways to reduce miners' stress

- Increase income through better gold recoveries
- Health promotion and education
- Disease mitigation
 - PRACTICAL health care interventions (Vaccinations, prenatal and postnatal care, etc)
 - Nutrition information
 - Water and sanitation
- Good business practice
- Micro-credit
- Alternative livelihoods
- Legalization

What else stops miners from adopting safer mercury practices

- Lack of realistic alternatives
- Perceptions
 - *"Mercury is not so bad as people say"*
 - *"Other diseases are more important"*
- Toxic exposures are invisible
- Lack of knowledge about consequences
- Attitudes
 - *"Men need to be tough"*
 - *"This is not my land...I don't care"*

What else stops miners from adopting safer mercury practices

- Miners have little political power
- In many cases, miners do not hold the mineral right titles
- Miners often avoid paying taxes
- In many cases, miners come from other regions (no link with the land)
- Miners are constrained by gold dealers who buy and control Au and Hg prices

What else stops miners from adopting safer mercury practices

- Barriers in past efforts to introduce new technologies
 - Developed without consultation
 - Too expensive
 - Too complicated
 - Just did not work
 - Miners did not think that change was worthwhile
 - Miners' mobility was not considered

Increasing Awareness

Miners can't afford to stop working to go to "school"

- Miners learn by hands-on training
- Miners should see BENEFITS:
 - More money
 - Better health
 - Better opportunities for their children
- Personal contact is critical: **CHAMPIONS** in the communities are needed

Awareness Campaign Strategy

- Increase impact of awareness campaign by partnering with stakeholders
 - Miner organizations
 - Miller organizations
 - Women's organizations
 - All levels of government (e.g. Departments of Health, Education, Mining, Mayors, etc.)
 - NGOs
 - International institutions

Awareness Campaign Materials

- Communicate
 - Mercury hazards
 - Mineral processing solutions
- Promote
 - Health seeking behaviors
 - Community health solutions (Child and women's health, Water and sanitation, etc.
- Country and culture specific
- Contain lots of pictures/illustrations
 - Very few words

Information Vehicles

- Radio and TV
- Videos (Animations)
- Newspapers
- Brochures
- Posters
- Billboards
- PowerPoints
- Speeches/lectures
- Songs (e.g., cordels)
- Community activities
- Comic books
- Hats, T-shirts, footballs
- Entertainment
 - Movies, soccer matches
 - Musicians and dancers
 - Theater and circus

Media Campaign

- Partnerships with local and regional media
 - Newspapers and billboards
 - Radio and television
 - Programming
 - Advertising with local and regional broadcasters
- Partnerships with suppliers and manufacturers
- Sports and TV celebrities

Brochures and Posters - technical -

- Overview of artisanal mining and mineral processing methods
- Gravity concentration
 - Sluices and centrifuges
- Grinding and crushing
- Mercury use
 - Amalgamation systems
 - Retorts

Brochures and Posters - health -

- Mercury hazards and solutions
 - Why Hg is a hazard and what people can do to protect themselves
 - What happens to Hg when it goes into the air, water and ground.
 - How mercury makes you sick
- Maternal and baby health
- Occupational health
- HIV/Aids and other diseases
- Water and sanitation
- Nutrition



Basic health care at TDUs

- Give families a direct, practical reason to interact with the TDU
- Build trust
- Show that better health is possible
- Provide basic assistance as an infirmary
- **MAKE THE LINK BETWEEN MERCURY AND HEALTH**

Brochures and Posters - community -

- Business and Micro-credit
- Organization and division of labour
 - Options and processes for communities
- Development of employment alternatives
- Legal issues (country specific)
 - Mineral rights
 - Formalization

Training Modules

Better Health, More Gold, Less Mercury

Modules:

1. How to extract more gold
2. How mercury makes us sick
3. How to use and re-use mercury safely
4. How to make more money
5. How to protect water supplies and improve sanitation
6. How to prevent HIV, malaria and other diseases

Challenges

- How to make campaign material fit a country's technical and cultural conditions?
- How to make the most with limited funds?
- How to address gender in different cultures?
- Awareness can lead to organizational change - what are the consequences of this?

Key steps

- Focus on community health as a whole
 - Mercury is just a small part of the problem
 - Address other pressing needs at the same time as mercury
- Focus in particular on women & family health
 - Women's historic concern has been for the health of her family

Key steps

- Go beyond "risk communication"
 - Offer solutions
- Promote health seeking attitudes
 - Build on cultural strengths and values
 - Support health enhancing behaviors
- Build awareness campaign from the bottom up, not from the top down
 - Consultation
 - Relationships

Success of the Train-the-Trainer Model



The GMP Team trained local miners on the use of retorts to reduce Hg exposure...



...later in the day, the local workers were teaching others in the community.



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Scope of the Divisions: 3. Results and Policy Development

Results and Policy Development

- **Compile results of:**
 - > Environmental and Health Assessments
 - > Socio-economic Assessments
 - > Legal Studies
- **Develop policy recommendations for government and local stakeholders**
- **Conduct stakeholder workshops**

Results and Policy Development

- **Study capacity for micro-financing for ASM in each GMP country**
 - to acquire mineral rights
 - to acquire better equipment
 - to promote better organization
- **Conduct stakeholder workshops with governments, banks, NGOs, and communities**
- **Test pilot micro-finance programmes**
- **Promote long-term solutions**



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Scope of the Divisions: 4. Risk Assessment and Reclamation Strategies

Risk Assessment and Reclamation Strategies

- **Evaluate techniques to reclaim Hg-impacted sites, e.g.**
 - Covering with laterite
 - Re-processing tailings to remove Hg
 - Revegetation
 - Dredging and treat Hg-polluted material
- **Make inventory of sites with artisanal mining activities in the study areas**
- **Create tools to evaluate environmental effects and correlation between sediments and Hg on water systems**
- **Create tools to predict risks of tailing dam failure and landslides in ASM regions**

Risk Assessment and Reclamation Strategies

- **Use GIS to evaluate the growth and mobility of artisanal mining:**
 - How ASM increased over time
 - Relationship between impacted area, Au production and Hg loss and mobility
 - Migration patterns of miners
- **Create tools to establish reclamation and mitigation strategies for mercury contaminated sites**
- **Develop plans for land use and economy diversification of mining communities based on natural resources vocation**



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Scope of the Divisions: 5. Media Relations

Media Relations

- Increase visibility of mercury and small-scale mining issues in media
- Communicate goals and activities of GMP
 - Press releases, background papers, and feature articles highlighting activities of GMP to keep news media and relevant agencies informed and updated
- Improve global partnerships

Conclusion

- Artisanal mining is a poverty-driven activity
- Hg emissions are increasing up to 1000 tonnes/a...and growing!
- Number of ASM is increasing with gold price and more women and kids are being involved
- GMP must focus this phase on INTERVENTIONS:

Building capacity – training and demonstrating solutions with miners, families and authorities

