




## *Use of Mercury Retorts in small scale mining goldmining*




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## *ASM Goldmining*

- Landscape destruction
- Small patches of forest destruction scattered geographically
- Erosion
- River siltation
- **Mercury pollution**
- Aquatic ecosystems damage (tailings and effluents dumping)
- Socio-cultural fabric erosion
- Human Health



Mercury



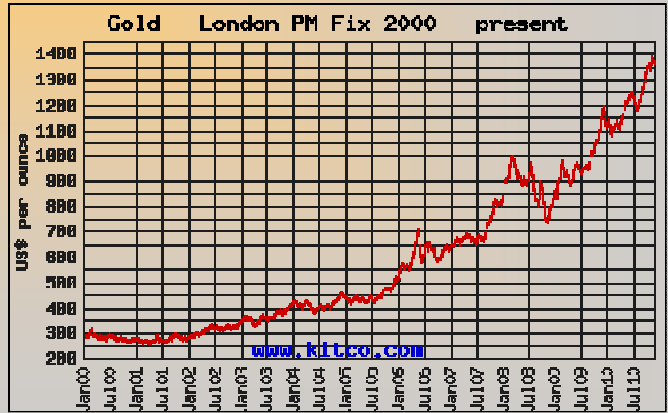
Tailings discharged in river






### ASM Gold Sector is Growing very fast – need to act now !!!!!

Gold price increasing = More people getting involved = more mercury in the environment



Hg occupational exposure is... obvious





## Why Mercury continues to be used by ASM?

- Mercury amalgamation is an ancient technique but still useful for artisanal gold miners-

- Main reasons by which Hg is widely used by ASM:

1. Simple technique
2. Widely available
3. Cheap (1kg Hg = 1g Au)
4. Long term consequences are not immediately seen
5. More interested in earning than environmental consequences
6. Mercury Impacts not very visible




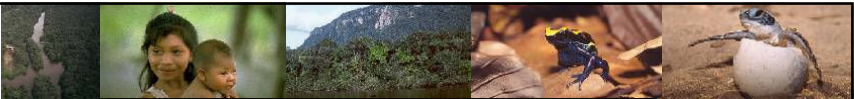

Mahdia, 2004



## WHY RETORTS ARE NOT USED?

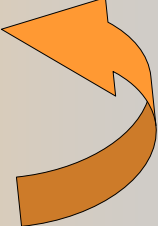
- Poorly informed about the dangers of mercury.
- New miners with little experience
- perceptions of the mercury retort
  - Loss of production
  - Discoloration of gold, hence, loss of value
- Miners do not know anyone affected by mercury poisoning
- Miners believe that being “up-wind” during burning is adequate to prevent mercury poisoning
- Miners believe that using certain types of leaves are good enough
- Mercury practices are habitual- done over 100 years
- Mercury is still ‘relatively’ cheap



*Negative cycle affecting miners*

- ✓ Inadequate techniques
- ✓ Low recovery & productivity
- ✓ Inability to re-invest
- ✓ Low income and savings



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- ✓ Poor health & safety conditions
- ✓ Environmental damage






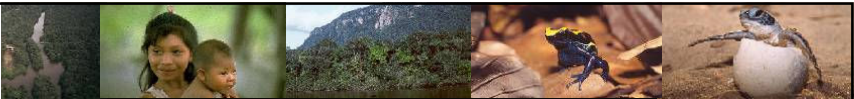
*Negative cycle affecting Government:*

- ✓ Inadequate operational resources
- ✓ Unable to control the sub-sector
- ✓ Unable to collect taxes/royalties
- ✓ Insufficient government income
- ✓ Corruption




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- ✓ Illegal operations






*Negative cycle due to out of date or lack of mining appropriate codes:*

- ✓ Inadequate information from the field (no info on Mining Regulations/Acts)
- ✓ No or inappropriate ASM policy
- ✓ Ineffective legislation and regulations
- ✓ Formalization barriers
- ✓ Non-compliance



✓ Uncontrolled sub-sector



TYPES OF RETORTS USED








**GGMC designed Mercury Retort**







## WHY RETORTS ARE USED?

- ✓ Some miners are adequately informed about the dangers of mercury through EEA campaigns.
- ✓ Can recover the cost paid for retort by recycling mercury
- ✓ Mercury is getting expensive and scarce
- ✓ In some cases well informed mine workers are demanding that the team use mercury retort.
- ✓ It is now a legal requirement for operations to use approved retorts for burning amalgam in Guyana.
  - Fines and imprisonment for breach of regulations
- ✓

**Mercury - A threat to eliminate**

**DESCRIPTION:** Mercury is used in the amalgamation process to extract gold from low-grade ores and tailings of ores. The amalgamation process involves the use of mercury to form a mercury-gold alloy. This alloy is then heated to separate the mercury and recover the gold. The mercury is then recycled for use in the next batch of amalgamation.

**EMISSIONS:** Global annual emission from artisanal and small scale gold mining is in the 850-10000 while natural emission is in the range of 1500-40000.


**IMPACTS:** Mercury is a neurotoxin and can cause severe health effects, including brain damage, kidney failure, and reproductive problems. It is also a major environmental pollutant and can be found in fish and wildlife.

**RECOMMENDATIONS:** Miners should be encouraged to use mercury-free technologies and to properly manage and dispose of mercury. Governments should enforce strict regulations on mercury use and emissions.

**Reducing the Pressure of Goldmining on the GUYANAS' ECOSYSTEMS**

**Impacts of mercury: Mercury poisoning**  
 Effects of mercury poisoning on the environment  
 Accumulation in the foodchain - Poison predator species and humans

**Mercury free technologies:**  
 Protection of the environment  
 for a living planet!


### ***CONSTRAINTS (MERCURY PROJECTS)***




- ✓ Geographically scattered nature of operations
- ✓ Small scale miners are very mobile
- ✓ Initial lack of thrust by miners
- ✓ Weak regulatory institutions
- ✓ Mercury practices are habitual – it is very difficult to move miners away from this activity
- ✓ Little government support for the sector
- ✓ Most equipment operators/miners do not have concessions





### ***Possible Solutions***

- Review and comparison of mining policy, regulations and legislation to foster international harmonization for improved management of mercury
- Restricting the supply of available mercury while promoting mercury free technologies
- **ONE COLLOBORATIVE GLOBAL VOICE** - with very strong messages to disseminate information to increase awareness of mercury pollution
- Develop appropriate video and other documentaries on the negative impacts of mercury to be shown in ASM countries
- Massive campaigns to spread out the knowledge and to introduce and implement the cleaner technologies are needed now **!!!!!!!**








## Draft mining codes (Guyana) Burning of Amalgam to Recover Gold

**Principle:** Protect workers, their families, communities and the environment from mercury vapors through the use of appropriate gold-mercury separation technology.

**Standards of practice**

- Do not allow open-air burning of gold amalgam under any circumstances.
- Promote the use of safe amalgam-burning devices, such mercury retorts.
- Enforce the Mining Laws that deal with the hazardous chemicals to ensure that retorts are used.
- Develop national standards and specifications for retorts.
- Demonstration of the manufacture and use of simple retorts (such as the kitchen bowl retorts)
- All persons involved in burning mercury use should use appropriate safety equipment and gears.
- Promote the setting up of processing centers

## Burning of Amalgam to Recover Gold

- Gold and mercury separation should be carried out so that maximum mercury recovery is achieved.
  - a) Gold amalgam should never be burned in open air because lost mercury cannot be re-condensed and recovered and will cause secondary exposure and contamination.
  - b) To burn amalgam, a mercury recovery device should be used, such as the retort, which consists of an airtight closed vessel fitted with a condensing tube to recover liquid mercury. There are some simple home made retorts that is effective for condensing mercury vapor
  - c) Children should not be around when amalgam is burnt.
  - d) Amalgam should not be burnt in living quarters or enclosed areas.







## *Conclusions*

- Several “mercury-free” alternatives are available and should be modified accordingly for ASM
- Most legal miners in La Guyane is working mercury free (Examples are available) . Lessons can be learnt
- Environmental mercury impacts are not adequately evaluated.
- Education and awareness should be promoted **ALONG** with alternative mercury free solutions.
- We should all continue to promote mercury free techniques to save the environment and humans from these atrocities.





## *MERCURY FREE GOLD IS POSSIBLE*




# THANK YOU