GOLD AMALGAMATION PROCESS IN MZ

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PRESENTATION LAYOUT

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INTRODUCTION AND CONTEXT

- ASM SECTOR
- **10 to 15 million artisanal gold miners producing 400-600 tonnes Au/a in more than 70 countries**
- **About 50-100 million people directly and indirectly involved in artisanal gold mining**

- In 2008, Brazil produced 54 tonnes of gold, of which 5.2 tonnes were produced by ASM
- Between 10 to 15 tonnes of Hg were lost by ASM
- 6,000,000 tonnes/a of Hg contaminated tailings into the rivers (Brazil)

CONTEXT

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

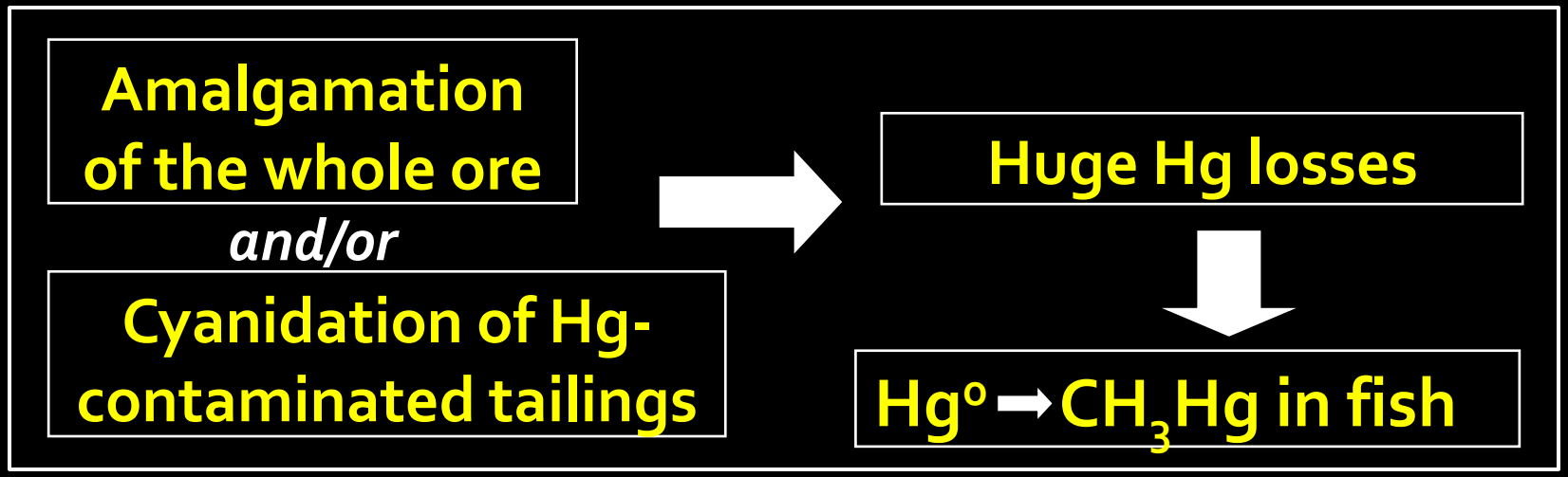
Worldwide >1000 t/a Hg is used and lost by artisanal miners 1/3 of the global Hg use is for ASM

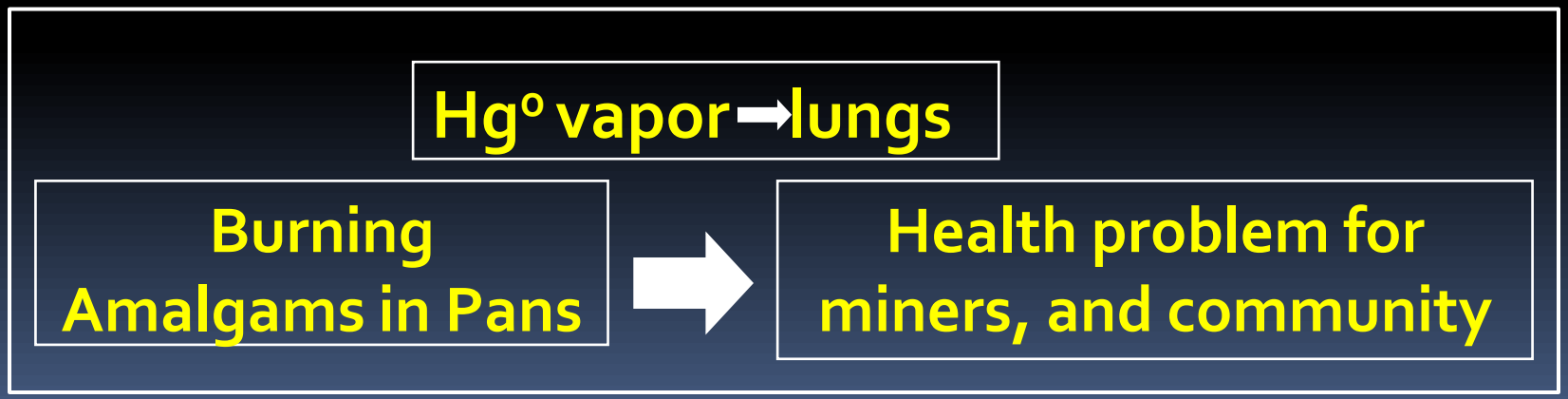
ASM IN MOZAMBIQUE

- Gold panning has been widespread in the Archaean part of Mozambique since the Monomotapa Empire *C.* 1500 AD.
- Presently around 100,000 people are directly involved in the sector providing subsistence to at least half a million people in the rural and poorest areas of Mozambique.
- ASM produce in average 0.7 grams of gold per day per miner. Working in groups of 5.
- Low recovery and mining and processing technologies
- Labour intensive
- Lack of geological knowledge
- Produces negative impacts on the physical and social environment.
- Mercury is used intensively in gold processing in Manica, Zambezia and Niassa Provinces, where primary gold quartz veins are worked.
- Manica show levels of contamination around 8.23 µg/m^3, about 8 times the WHO recommended levels of Hg in humans. The amount of mercury that is used for processing one gram of Au, range between <1 and 15g.

PRE AMALGAMATION PHASE

AMALGAMATION PROCESS





AMALGAMATION IN MZ

Whole ore amalgamation is used for primary gold.

The ratio of 4-15:1 Hg:Au is estimated in whole ore amalgamation. In some countries you can find ratios of 50:1 (Indonesia)

The process of amalgamation itself frees up to 60% of mercury into the atmosphere.

- For fine grain alluvial gold the Hg is added after pre concentration
- The ratio mercury gold is as little as <1- 2:1

Amalgam roasting and whole ore amalgamation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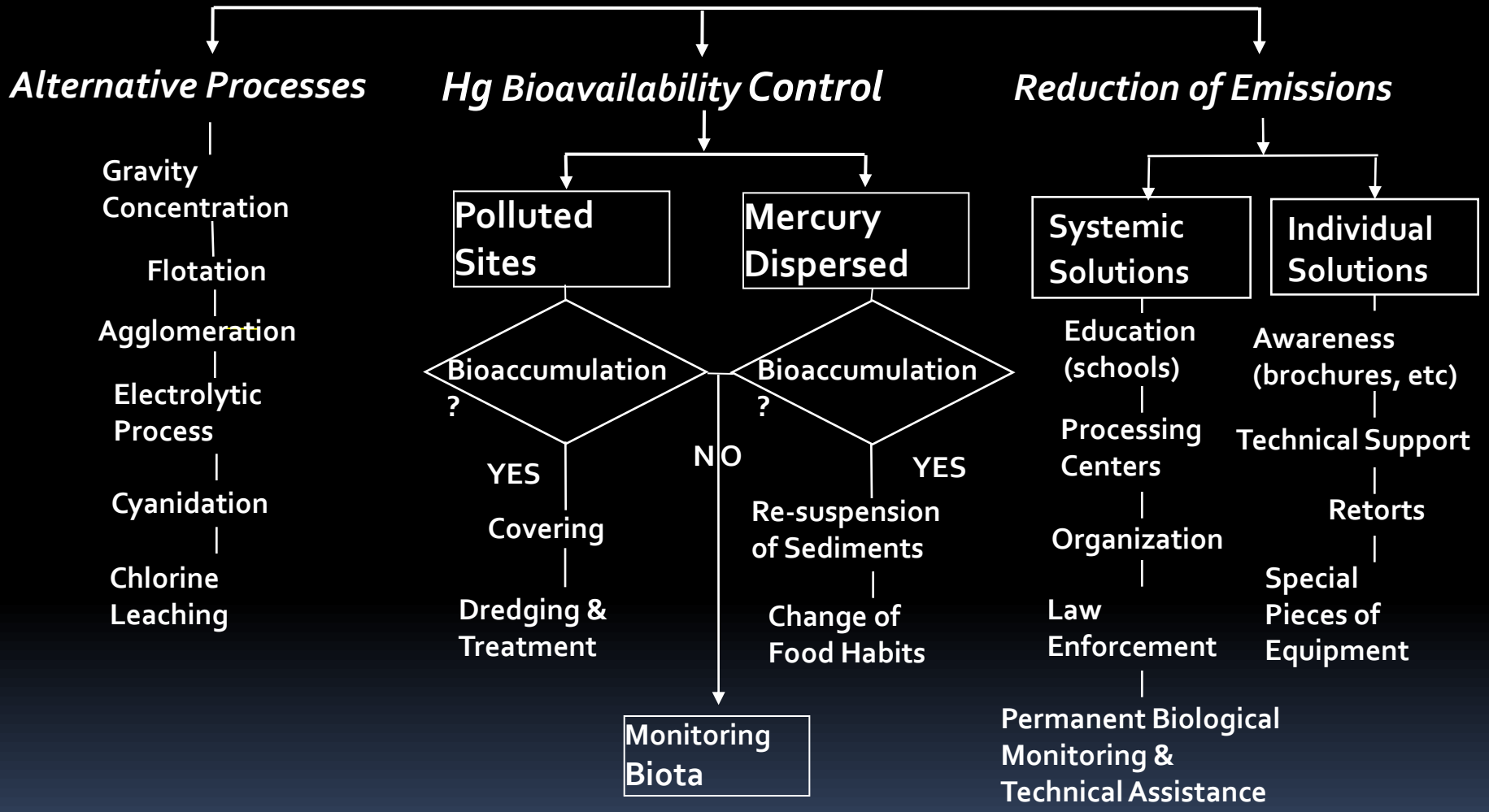
Solutions for Hg Pollution in Mining



UNIDO, 1997

Existing Mercury Reduction Technologies

- Reducing open burning: Vapour Capture
- Reducing open burning: Retort use
- Moving away from mercury whole-ore amalgamation
- Reactivation of mercury
- Avoiding combining mercury and cyanide
- Zero Mercury Processing by direct smelting

PRE-CONCENTRATION OF ORE

- The most important step in reducing mercury usage is **concentration**
- Concentration of gold from ores into smaller masses either (a) reduces the amount of mercury needed; or (b) allows a zero mercury technology to be employed – such as direct smelting
- Key aspects of good concentration are gold liberation (milling) followed by appropriate concentration technology
- Both require adequate capital – often a function of community stability/legality

I Thank you