

CREATING A SUSTAINABLE ARTISANAL AND SMALL-SCALE GOLD MINING SECTOR

CASE STUDY: MERCURY CAPTURE SYSTEM

By capturing vaporized mercury in small-scale gold shops, the Mercury Capture System could prevent the release of hundreds of metric tons of the neurotoxin annually.

Existing Process

Throughout more than 70 countries, approximately 50,000 small-scale gold shops vaporize mercury to refine gold ore. Through this process, elemental mercury is released into the atmosphere, severely impacting the health of local and global communities. Mercury is a powerful neurotoxin that impairs learning, memory, and many of the senses, and can harm the brain, heart, kidneys, lungs, and immune system. In most gold shops, there is no filtration or capture of vaporized mercury, allowing air borne concentrations to reach over 100 times the safe level.

Intervention

The Gold Shop Mercury Capture System (MCS) is a low cost, low maintenance, mercury capture device. Developed by the U.S. Environmental Protection Agency (U.S. EPA) and the Argonne National Laboratory, the MCS is easy to construct, simple to install, and can reduce gold shop mercury emissions by more than 80 percent. The MCS is constructed using a 55-gallon steel drum, where mercury vapor is cooled, condensed, and collected as liquid for safe management.

Outcomes

- MCS was successfully piloted in Peru and Brazil in 2008;
- Mercury vapor concentration decreased approximately 5- to 20-fold in gold shops;
- Widespread MCS use could prevent the release of more than 200 metric tons of mercury into the atmosphere annually, thereby preventing harm to humans and the environment;
- The challenge now is to encourage and facilitate use of this technology in gold shops around the world.

For Further Information

Argonne National Laboratory, 2013. Manual for the construction of a mercury capture system for use in gold processing shops. U.S. Environmental Protection Agency, Office of International and Tribal Affairs. 31 pp.

www.epa.gov/international/asgm/

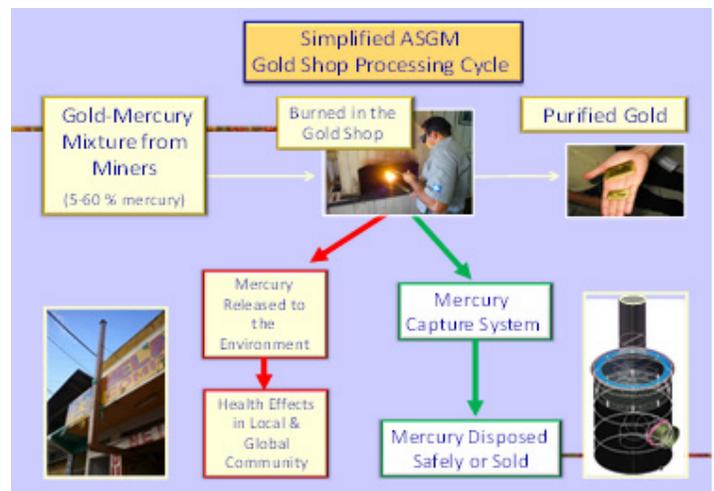


Above: The Mercury Capture System, shown being installed in a gold shop in Peru, can reduce mercury emissions by as much as 80%. Right: A prototype of the MCS before being field tested by the U.S. EPA and National Argonne Laboratory. Photos courtesy of the U.S. EPA.



Reasons for Success

- Designed by the U.S. EPA and Argonne; piloted with local collaborators;
- Constructed of readily available materials;
- Costs less than \$500 (U.S.) to locally produce;
- Easy to transport;
- With proper installation and use, can capture more than 80 percent of mercury produced in small-scale gold shops.



A simplified schematic of amalgam burning and mercury release in a gold shop. The MCS can help reduce the risk of exposure to mercury for gold shop owners, adjacent community members, and the global environment. Photos courtesy of the U.S. EPA.