

Project

Training of small-scale miners and their families in safe handling of mercury during extraction of gold in the Philippines.

Improving access to social services: health services and income opportunities for small scale miners and their families.



Young children pan for gold ore in Camarines Norte, Philippines

The problem

Gold extraction techniques in two small-scale mining areas in the Philippines were investigated. These investigations showed that the small-scale miners in the two areas use excessive amounts of mercury and in total these communities release in order of 5000 kg of mercury to the environment per year.

Burning amalgam only accounts for a very small part of the mercury lost to the environment. The major contribution comes from small-scale miners who add mercury to the rod mills.

The project

Teaching and training courses were held for small-scale miners in improved techniques in use of retorts, whereby they can significantly reduce the release of mercury. The small-scale miners were also introduced to the non toxic, cheap and simple borax gold extraction technique. This technique has been used for years by small-scale miners in the Benguet area north of Manila. A pilot exchange program has been carried out whereby small-scale miners are brought to the Benguet area in order to learn gold extraction techniques not using mercury or other toxic compounds. Teaching and training courses were also held for health providers such as medical doctors, nurses and midwives.

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Carried out by

*Maximo T. Kalaw
Institute for Sustainable Development
in cooperation with Geological Survey of Denmark and Greenland, Zamboanga del Norte Center for Social Concerns and Development (ZNCESCOD), and Pook Mirasol Center for Appropriate Technology (POMCAT)*

Mercury beaten up to small drops in rod mills lose the ability to coalesce and can thus not be retrieved by the small-scale miners, but end up in the tailings. The tailings are subsequently sold to cyanide plants where the gold is extracted.

In the cyanide plants some of the mercury forms mercury cyanide complexes whereas most of the mercury is still in metallic form. The tailings from the cyanide plants thus contain high amounts of metallic mercury and mercury cyanide complexes.

Child labour



Young boy diving for gold ore

*"The water is muddy
so he cannot see anything."*

Child labour is widespread in one of the investigated areas where the so-called compressor mining is practiced. These small-scale miners dig holes about one square metre across and often more than 20 metres deep. The holes are filled with water and the miner dives down to the bottom of the hole with a plastic hose in his mouth (see opposite).

The hose is connected to a compressor. The miner works on the bottom of the hole for up to 5 hours. The miners often ascend too fast and acquire diver's syndrome, which is often dismissed as 'fatigue' from working for straight hours in the muddy water. The gold is concentrated at the surface by panning carried out by children.

The teaching and training sessions targeting the miners and their families is envisaged to result to significantly reduced release of mercury to the environment, lower processing cost (and, by association, higher income). In addition, involved medical personnel are expected to provide appropriate information and better health services to the mining communities.

Borax technique

Mineral concentrate is mixed with borax and a few drops of water. The mixture is heated in a small ceramic bowl using a gasoline fuelled blow torch. The borax lowers the melting point of gold. The gold melts and all other heavy minerals, which are lighter than gold floats on top of the molten gold. Upon cooling a very pure gold pellet is produced.



For further information contact

EMY PEREZ : imeldificperez@yahoo.com

Peter Appel: pa@geus.dk