



» **GOLD ORE IS CRUSHED** by hand, then processed in a drum and pulverized until it resembles flour. The powder is mixed with mercury and washed in a feed system in which gold is extracted.

Photo: Jette Hagensen

Environment and Health Pay the Price for Glittering Gold in Tanzania

MERCURY Nearly 700,000 Tanzanians work in small-scale gold mining. But the methods of extraction result in massive mercury contamination and have grave consequences for health and well-being. Often, it is the only way for many local gold miners to make a living, and NGOs working to solve the social and environmental issues lack support.



By Jette Hagensen

Extraction of gold in Tanzania has exploded in recent years. Parallel to big gold mines owned by international companies, nearly

700,000 people work in small-scale mining in Tanzania, and six times as many are economically dependent on the sector.

In the area near Lake Victoria in eastern Tanzania, substantial amounts of gold have been located. Prior to the introduction of mining in the mid-1990s, the local population mainly lived by small-scale farming.

In 2005, when the government

allowed multinational companies to extract gold, locals were chased away. Some were compensated for their land, but many were left empty-handed.

Unemployment is high in the region, and a rising world market price for gold has led many to try their luck in the informal, often illegal small-scale gold mining sector or make a living in relation to the mines.

Several methods of small-scale



« gold extraction exist, but mercury is most frequently applied in Tanzania and many other African countries.

As a side-effect, approximately 1,690 tonnes of mercury are discharged to the surrounding environment every year, doubling that of coal burning, which, until recently, has been the greatest manmade source of mercury pollution.

In Africa, local gold miners have neither land ownership nor mining license. This forces them to live from hand to mouth, complicating a transition to other methods of extraction.

Mercury harms unborn children

Mercury, a heavy metal, is toxic to humans as well as the environment. While ingestion of the metallic mercury applied in gold extraction is not directly poisonous, inhalation is hazardous. In the food chain, it is transformed into organic mercury, a strong neurotoxin poisonous to both humans and animals.

Organic mercury may cause severe damage to the brain and nervous system, and pregnant women are especially exposed. Studies show that mercury may affect embryonic development of the nervous system and cause mental and/or physical retardation of children, learning difficulties and neurological disorders.

Waste from the gold mines containing substantial amounts of metallic mercury is dumped in neighbouring rivers or elsewhere in nature. Through the food chain, this leads to concentration in for instance fish. Humans who in turn eat these fish risk ingesting large amounts of organic mercury.

When you heat up metallic mercury, inhalation of the fumes becomes very toxic. Mercury contents in the air are especially high in areas near the heating process with readings as high as 50,000 ng/m³.

As a consequence, workers who participate in that part of the process breathe in large amounts of mercury vapours, and locals are similarly subjected to the vapours. In Ntomvu, the heating process takes place in the very

centre of the village so children and pregnant women are severely exposed even if not actively participating.

What will it take to change?

The mercury consumption of small-scale mining is still on the rise globally; especially in certain less developed countries. This has been taken into account by a number of initiatives aiming to introduce new, mercury-free methods of small-scale gold extraction. One solution is to use a retort able to recirculate as much as 95 percent of the mercury used to extract gold. Another method substitutes borax for mercury. Despite apparent benefits of other techniques, use of mercury is still the most prevalent method in Africa by far. Some question whether borax is at all

He says that he feels like a refugee in his own country.

His family's soil has been seized, and seeing as they lack ownership of the areas from which he now extracts gold, the police can show up anytime and chase him and the other gold miners away.

At all times, they must be ready to move to a new place, and for this reason, many refrain from sending their children to school.



Photo: Jette Hagensen

» MR. LAMASIMI is angry at the government and feels like a refugee in his own country

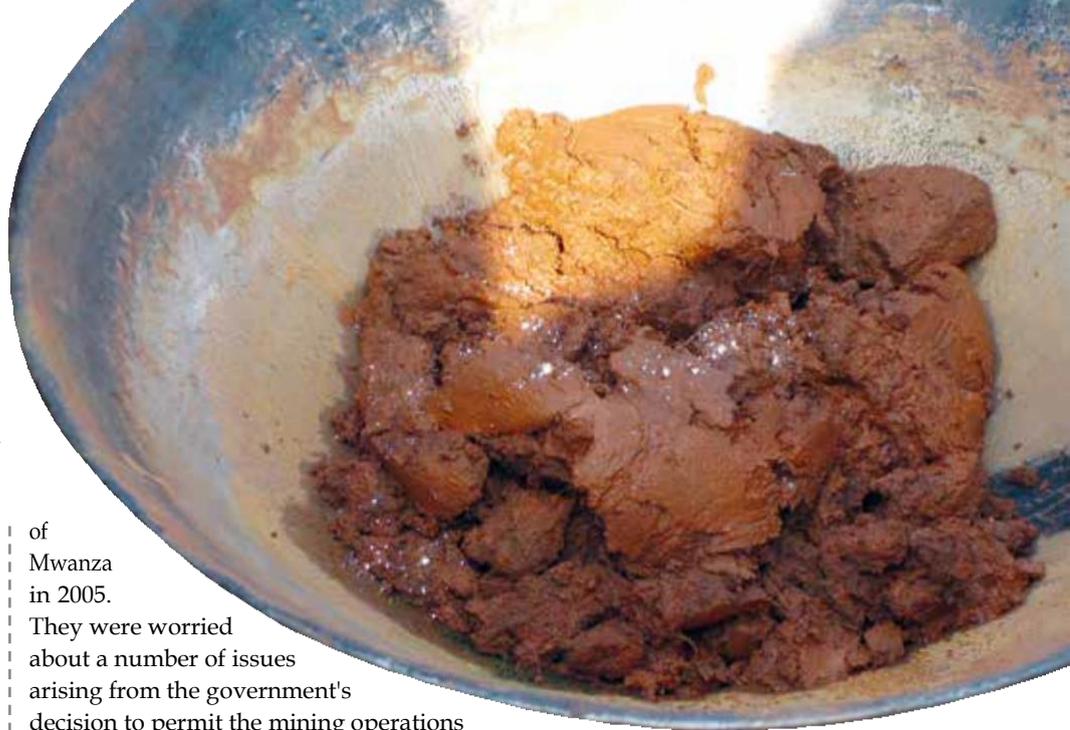
Like a refugee in his own country

Some former farmers now live and work in the mining village of Ntomvu, 5-6 km from Geita, the capital district. Mr. Lamasimi has worked in mining for some years with ore crushing as well as gold extraction, but also as a merchant, purchasing and reselling gold. Although he was successful and made enough money to buy both a house and a car, he is still angry at the government.

capable of replacing mercury - but the method has actually proved successful e.g. in the Philippines.

A study from the mining village of Lwamgasa in the Geita Region may provide a clue as to why new methods have been so difficult to introduce. 15-19 percent of the respondents are illiterate, and a third of them do not believe mercury to be toxic nor to cause illness and death. Further, some completed projects have been deficient in both legitimacy and continuity.

Other sources point out that social problems are a barrier to change their practice. There are many widows e.g. due to AIDS and mining accidents; alcoholism affects other families, and lack of schooling and child labour is widespread. Besides, many rely on local



witch doctors rather than physicians and health professionals.

The fact that gold prices have multiplied in the last few years might also have motivated locals to stick to 'business as usual' in the struggle for family survival. As such, miners are economically significant to many local communities of the country in which 89 percent of the population still live on less than two dollars a day. As long as no alternative means of income exist, it would be fatal to eliminate such an opportunity.

In light of this understanding, Jønsson and others recommend that new, less toxic methods are introduced while bearing in mind:

- Acquiring an accurate sociocultural understanding of local communities.
- Support from local authorities.
- Full inclusion of the demographic in both planning and implementation.
- Transparency and flexibility in adjusting the technology to local conditions.
- That continuous observation, monitoring and evaluation is crucial

Local NGO fights for improvement

A local NGO, Sidi Tanzania, was founded by a young group in the city

of Mwanza in 2005. They were worried about a number of issues arising from the government's decision to permit the mining operations of multinational companies in the area. They aim to ensure environmental, social and economic sustainability for the local population that, short of ways to make a living, choose to work in small-scale gold extraction. They see how locals want to make good money, but they also recognize risks such as mineshaft collapses, ore crushing accidents, mercury contamination and legal threats due to lack of mining authorizations or property ownership. Add to this the social issues, which include lack of schooling. Sadly, Sidi Tanzania is met with indifference towards the problems from both the government and international donors.

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THE BORAX METHOD

The borax method is an alternative to using mercury, which yields more gold than mercury amalgamation and for a cheaper price. Borax is far less harmful to humans and the environment than mercury.

THE MINAMATA CONVENTION

The Mercury Convention was adopted in October 2013 to protect humans and the environment from the harmful effects of mercury. It will phase out many current uses of mercury and prohibits new mercury mines from being built while phasing out existing ones. It also regulates mercury use such as in small-scale mining.

FACT SHEET

This article is part of the Danida-backed project on the Environment and People of the Global South. The project also includes an educational pamphlet for secondary schools with more cases on environmental issues and NGOs in the Global South working to make a difference.

The pamphlet titled "Brave Front-Line Fighters in the Global South - Personal Accounts from the Fight for Sustainable Development" was released in December, available at www.emu.dk and www.envice.dk.



Photo: Jette Hagensen

» **WHEN THE MERCURY METHOD** is used in villages, locals are also exposed to the mercury vapours even if they do not take part in the work.