

# MWAMBA COMPANY

## PROFILE

**Artisanal Small-Scale Gold mining  
(ASGM)**

**Prepared**

**by**

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## **ACRONYMS AND ABBREVIATIONS**

**ASGM** : Artisanal Small-Scale Gold Mining

**CEO** : Chief Executive Officer

**CFO** : Chief Financial Officer

**CIP** : Carbon in Pulp

**COO** : Chief Operations Officer

**DRC** : Democratic Republic of Congo

**DSM** : Dar-es-Salaam

**GDP** : Gross Domestic Product

**QWL** : Quality of Work Life

**TZ** : Tanzania

## THE COMPANY INFORMATION SECTION

**Headquarters:** Mwanza, Tanzania



**Location:** 2° 31' 0.12" S, 32° 53' 24" E

**Office sourcing locations:** Geita, Musoma, Katoro, and Kahama mining regions

**Email address:**

**Number of employees:** 8

- Hundreds benefit indirectly as dependents
- With the potential of employing hundreds in the future

**Management directory and founders:** 3

**Advisers:** 4

**Primary line of Business:** Gold mining and trading

**TZ Annual sales:** \$224 million annual sales (country's exports for artisanal mining)

**Total exports:** around \$2.5 billion

## **Introducing Mwamba Mining – bring mercury-free artisanal gold mining into the 21<sup>st</sup> century.**

When we think of mining we often think of large-scale projects, using new technology such as UAV surveys and a move towards automation. Yet artisanal and small-scale mining still continues in approximately 80 countries worldwide, with up to 40 million people working in the sector. That shouldn't be surprising, we know mining is one of the most ancient industries known to man, and the barrier to entry as an artisanal miner is very low. Compare that to 7 million people worldwide involved in industrial mining.

Mwamba mining, operating in Mwanza, Tanzania, is a young company that is looking to bring artisanal mining up to date in a way that could have global implications for this sector of the mining industry.

Mwamba provides processing services to the artisanal miners of Mwanza, but critically, also as a broker and dealer for these miners in a regulated way that was previously difficult for the miners to access.

Mwamba's business model is to facilitate the connection of artisanal gold miners with international gold markets or institutional buyers. The founders of Mwamba Mining, Thomas and Eduard Cornew and Samuel Bahebe, came up with the idea for the company whilst studying at Dartmouth College's Thayer School of Engineering. The seed of the company came from a project to develop an affordable mercury recapture device to be used by artisanal miners – mercury being widely used in the extraction of gold from ore within small-scale mining as it is both cheap and readily available. The UN has reported that artisanal mining can release up to 1400 tonnes of mercury into the environment per year, that's about 40% of the world's total. Faced with this information, the team realised that going back to first principles and seeking a mercury-free solution had to be the way forward.

### **The problem with mercury... and the solution**

Mercury is extremely toxic and therefore a risk to health. Mercury is very persistent within the environment. In the case of Tanzania, where Mwamba have started their operations, mercury used in mining has been found in the submarine creatures in Lake Victoria – fish being one of the key sources of protein for the communities living around the lake.

“Mercury is highly toxic. Once polluted it contaminates the water table and bio-accumulates in the local food chain. This means that once ingested, mercury will stay in its host indefinitely. If a contaminated host- say a fish- is consumed by another fish, it passes all its mercury to its consumer. With time, this phenomena cause's fish to have a vastly higher levels of heavy metals like mercury than the water they inhabit. Bioaccumulation makes mercury poisoning a serious health-risk for all Tanzanian's for whom fish is a key source of protein,” commented Eduard, one of the directors of Mwamba.

In addition to the environmental damage, is the fact that using mercury is a very inefficient way to extract gold from ore, typically only extracting somewhere between 30-50 % of the

ore's gold content. So, both financially and environmentally, there had to be a better process available to the miners of Tanzania.

CIP is seen by many as a preferable alternative to mercury usage for gold mining as it is possible to recover up to 98% of gold content which surpasses the 30-40% recovery that mercury condemned the industry to in the past. The mercury processing is discouraged since it is proven to be toxic and harmful to the health of miners, their communities, and the ecosystem at large. So CIP provides the miners with better extraction rates for their gold, and vastly reduces the amount of mining related pollution entering the environment.

Eduard, Thomas and Sam stated: "We aim to construct processing facilities in every artisanal mining hotspot across Tanzania, ushering in a mercury-free future for Tanzania's artisanal mining sector. Once they are in place, we will be able to begin sourcing not just from miners using proper cyanidization processing techniques, but also from those who currently rely on mercury processing methods. While we plan the construction of our first facilities, we have begun implementing a miner sponsorship program helping under-capitalized & mercury-dependent miners take advantage of existing processing infrastructure. In the Sponsorship program, Mwamba offers miners the forward financing they need to be able to pay to have their ore processed using locally available processing infrastructure."

This improvement in the processing means that for the same amount of ore, partnering mines will effectively double the amount of gold they produce for the same labour and quantity of ore.

### **Bringing the technology right up to date, with Blockchain.**

The oldest known mine in the world is the Ngwenya Mine in Swaziland. A hematite mine radiocarbon dated to be approximately 43,000 years old. The technology employed in artisanal mining is often seen as very basic, and in many ways ancient. A novel approach to handle the tracing and tracking of all key processes used by Mwamba and the miners they operate with is to employ Blockchain technology. This technology is designed to safeguard data integrity, with the potential to streamline accounting and verification processes for Mwamba and the greater artisanal mining community.

Blockchain, in its most simple sense, is an incorruptible record that can be used to record any kind of transaction. The beauty of blockchain in this sense is that it engenders trust, as the records are secure, and not managed by a central company or authority – the information tracked can be shared by all.

## **Why Tanzania?**

Whilst artisanal mining is seen in many areas of the globe, the way it is handled by different jurisdictions is hugely variable. From countries where it is actively discouraged, through to countries like Tanzania which seeks to develop artisanal mining to encourage safer working conditions for the miners whilst simultaneously helping the economy of the country to grow.

The Legalization and formalization of the artisanal mining sector by Tanzanian government has provided advantages to Mwamba which simply aren't available in other jurisdictions. As proof of concept for mercury-free gold mining in Africa – and perhaps globally, it looks like Tanzania could be the perfect place to start.

Being able to allow a controlled-form of artisanal mining to continue whilst being recognised and supported from central government could be an ideal way to take this sector of the industry forward. In South Africa, artisanal mining is illegal. Conversely, in the Democratic Republic of Congo, in-demand minerals are both in huge demand globally and found in abundance. Here, the government has allowed artisanal mining to be carried out in some areas under state control. This has, to some extent, offset the failures to-date of the government to provide basic services to an often-impooverished community.

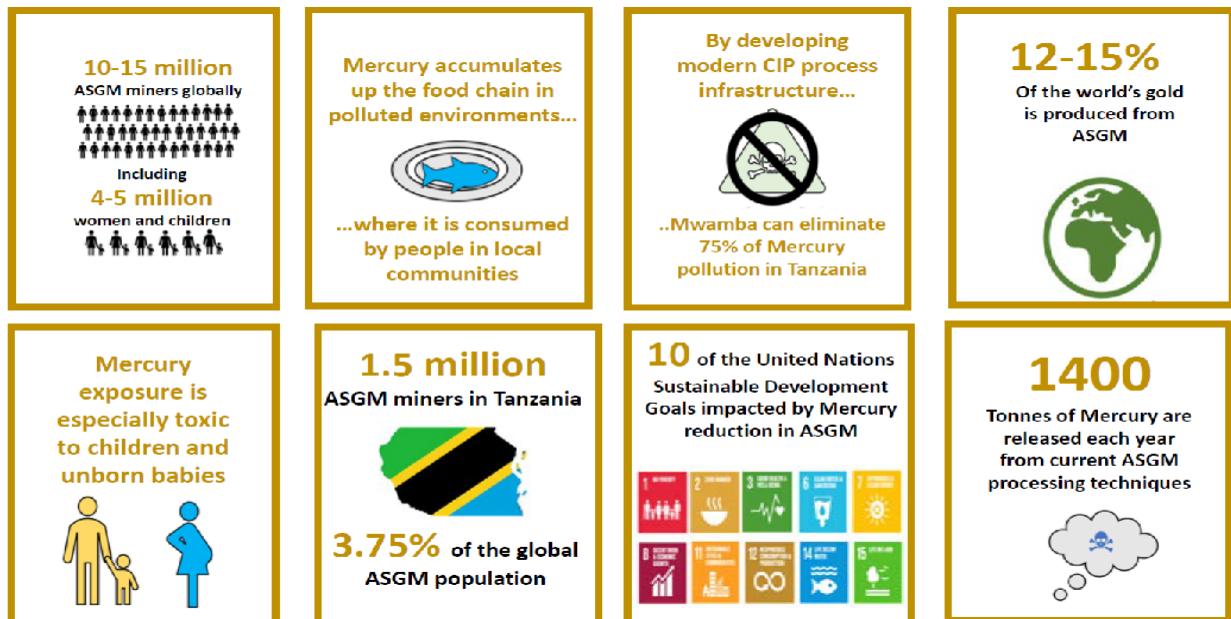
Compare this with the situation in Tanzania where Mwamba Mining, and other stakeholders in the business, have the support of the government.

## **Strengths of Mwamba Mining**

Mwamba employs a 'people first' principle in Tanzania. This is often heard from mining companies, and we see and hear a lot about community engagement and Corporate Social Responsibility (CSR). CSR is often seen, somewhat cynically, as a PR tool, or perhaps as a means to an end in order for large mining corporations to obtain mining rights in their host countries. Mwamba differentiates in that its primary directive is to aid the artisanal mining sector to the best of its ability, and not only enough to satisfy corporate interests. Given Mwamba's ambitious goals for the sector, a people first approach is really the only sensible option. Artisanal mining is, by its nature, at the heart of a community. So to be seen driving a new initiative like this forward, and to share profits and dividends in a fair and equitable manner, is one of the guiding principles for Mwamba. "Mwamba will only succeed if it's partners succeed. For Mwamba to be profitable, it must be valuable to its partners. Our value-centric strategy has helped us develop solutions that create marginal value for everyone involved" said Eduard, a Mwamba Mining director.



## Artisanal mining overview – infographics



## Scalability of Operations

The team behind Mwamba have global ambitions but are tempering that with reality. For the time being, they want to get the process of small-scale mercury-free gold-mining working as effectively as possible in Mwanza first, before looking further afield.

Critical to the success of the project here is the involvement of community leaders and the local workers. These elements aren't always too easy to bring on board.

## Key Process Section

The focus of Mwamba has been sizing the amount of available ore and tailings reserve, as well as the average production of each shaft. To assay the ore the company uses XRF based readers. This helps the company to estimate the purity and chemical processing requirements of each ore sample.

Eduard indicated in addition that: "the process of sampling, in itself, is a friendly way of expressing interest, building good rapport, and working towards an agreement. The exercise gave us a geographic map of where the miners we intend to help are located. With this map, we are currently identifying the best location to begin construction on our first facilities.



## Competition

However, two aspects of competition are worth mentioning:

- **Processing Providers**

We enable the processing providers we work with to compete against providers who require payment up front. Our organisation sponsors miners with forward financing, paying for their ore to be processed in locally available processing facilities. This gesture enables the processing providers we partner with to fill more business and compete against providers who require payment up front.

- **Local Broker Dealers**

It is only by necessity that competition is entered against a local broker dealer. The UN has established reducing the local supply chain as one of the best ways to empower ASGM miners. Mwamba sources directly from miners and sells directly to international buyers, eliminating unnecessary profit sharing. Direct distribution allows the company to reliably authenticate miners and verify their product. “This means that artisanal gold in the Mwamba ecosystem is worth more than the majority of artisanal gold,” according to Eduard. “Artisanal gold is often discounted for a lack of documentation. At Mwamba, we do direct distribution to help miners claim their identities and gain visibility in a global marketplace.”

## Building knowledge from the ground-up

One of the strengths of Mwamba is due to its relatively young age. The team at Mwamba have worked from day one directly with local entrepreneurs and those involved with mining on the ground in Tanzania. These local experts bring with them a whole host of local knowledge and personal contacts that is time consuming to build up and has helped in getting their Mwanza project up and running and accepted by the local community in a short time frame.

This relationship with the community in Tanzania is not to be undervalued, particularly when you remember that this is a business based on artisanal miners, not corporate employees. The ability to communicate with the miners in their own tribal dialects to the miners and other related professionals is critical. These people want to see their own industry succeed, to see their own communities flourish, but also have an eye on the future success of their country. Having members of their own community lead the development of the project, rather than ‘Wazungu’ - a Kiswahili term meaning white people – who are often viewed with suspicion when they come in and try to control the whole process, is another key to success. Viewed by some as of secondary importance, it’s clear that Mwamba see this level of community engagement as central to their success.

## Upgrading the technology in the field

Whilst Mwamba is built on the promise of a mercury free future for Tanzania's artisanal mining sector, it has embraced other ways in which it can help its partnering miners. An often-overlooked problem in artisanal mining is the difficulty miners experience in identifying the rock-veins or "*mwamba*" worth mining. Often this has been a completely hit-or-miss affair.

In order to help the miners Mwamba has invested in a magnetometer:

"Using the magnetometer, we can help miners make highly- educated decisions on where to dig shafts. This device uses magnetic waves to detect the presence of gold bearing ore. Once surveyed, we will have a good indication of what the gold vein looks like underground. This allows us to steer our partnering miners towards productive shafts, minimizing the amount of labor wasted on unsuccessful exploration efforts" (Thomas).

## Dealing with issues of scale

Tanzania is seen by many as leading the charge on regulating artisanal mining, partly due to the fact the government there acknowledges the role mining plays in alleviating poverty. There is a role for artisanal mining to play in the global economy, but often large and small-scale mining can be in competition.

Eduard at Mwamba described the traditional relationship between small and large mining as being characterized by a "signal and steal" dynamic. Often the presence of artisanal mining communities prompts large scale mining corporations to conduct sophisticated surveying on the land they occupy. If artisanal miners are found to be on a large resource worthy of an industrial development, the land is acquired and the laborers left jobless."

Mwamba is seeking to improve mining from the ground up by working in partnership between the company and the community, rather than taking a top-down approach.

## Achievements to date

Mwamba has already managed to guarantee ownership rights to a network of miners involved in their initial project in Tanzania, and has seen an increasing number of miners eager to get involved with their mercury free technology, an indication that increased access to modern processing could succeed in eliminating mercury in Tanzanian artisanal mining.

Mwamba holds licences as broker/dealers and is now establishing their processing services model. Improved anti-smuggling protocols will also be critical to how Mwamba operates. Rather than gold being declared and taxed as it leaves the country, it will be possible for this to happen at the processing centres. (include reference to fact this reform is currently being implemented)

## **A viable socio-economic business model**

Mwamba's business model is friendly to artisanal gold mining as it caters for vertically integrated revenue streams.

- Mining: develop and mine land for ore
- Processing: process ore into gold
- Distribution: sell fair trade gold in international markets

To do the above, Mwamba will either co-own and manage mines or invest in infrastructure to raise the productivity of partnering mines.

One of the key differentiators for Mwamba is the fact that they act in a genuinely collaborative way with the local miners. They provide the financing needed to allow existing stakeholders to excel in their verticals. In this way, Mwamba does not displace the artisanal mining sector of yesterday, but rather empowers it to create a better future for itself.

## **Financials (Specifics – how much funding, how long will it last for, what is the next stage?)**

Mwamba is presently secure in terms of funding having secured the necessary funds from early investors in the US. The company's strategy is to grow at a sustainable rate, creating not only profits but also wealth in the process.

With a Tanzanian co-founder, Mwamba was able to manage its policy correctly in accordance with the law. The company's ability to network and engage with the ministry of minerals played a role in adapting to the current fiscal policy in the country. As the CEO puts it: "everyone knows we are there to help, we are not there to compete..."

"The only tax policy we had issues with was the export of the gold itself. The export tariff was raised recently from 3% to 7% which changed the local dynamics within the small-scale mining community, as small players were pushed away from legally regulated mining economies. The tax increase made smuggling more prevalent, making it harder to remain profitable when competing against black market actors paying no exit tax."

## **The future – the people are the key**

For the next 12 months, Mwamba seeks to implement an aggressive infrastructure development plan to support the mercury-free gold mining operations in a sustainable way.

The ability to apply technologies and practices that hitherto have only been available to larger scale, industrial mining projects, to the world of the artisanal miner, is a great example of how mining can change lives for the better. We'll be keeping a close eye on Mwamba as we believe the business model they are currently refining in Tanzania is one that could be scaled-up and applied in many other territories globally.

