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Viewpoint

Zamazama, "illegal" artisanal miners, misrepresented by the South African Press and Government

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ABSTRACT

Contrary to views of South African government officials and the media, illegal miners (*zamazama*) in South Africa are better described as 'artisanal' miners and entrepreneurs who create significant numbers of jobs and economic value for many local communities. For the most part, they are not ignorant desperados, nor especially violent. They have unusual non-standard mining skills and knowledge that is distinctly different from industrial miners. They exploit gold resources that major mines cannot access and interact directly with global markets. With better legislation and, possibly, training, they could be economic assets and elements of the national heritage.

The miners who are currently described as 'illegal' in South Africa are widely misrepresented by the public press, and misunderstood by government. They are presented as an ignorant rabble drawn from the poorest of the poor, often from other countries, stealing gold from the nation and from the legitimate mines. We read stories of the so-called *zamazama* ('try and try again') dying in 'turf wars' between 'gangs' in underground galleries. This stereotype is not borne out according to current research led by Professor Robert Thornton, in Anthropology, and Professor Kim Hein, in Geology, at the University of the Witwatersrand (Thornton, 2013). Our work appears to be the first in-depth interdisciplinary research done on artisanal or 'illegal' mining in South Africa. Recent work in Ghana has reached similar conclusions (Nyame and Grant, 2012, 2014).

First of all, it is not clear under what legislation or bylaws the activities of these miners are illegal. While they are often trespassing on mine-owned property, this same property is criss-crossed with pathways that are used by everyone in the vicinity to get to work, or to visit the shop, friends and relatives. And of course, South African laws that pertain to the surface do not govern the underground resources. It is illegal to own or trade in raw gold and other 'precious metals', but until the final process that results in refined metallic gold, the material they deal in is just dust and dirt. They know that this (usually) contains gold, but in Roodeport anyone could become equally guilty of this by loading a wheelbarrow with dirt from a hole since the whole area is underlain by the Central Rand Goldfields and gold is being mined by some in surface soils. The Mining Resources Act only allows industrial mines to hold or process mined material, and only registered industrial mines can obtain permits.

Artisanal miners are therefore automatically 'illegal'. They are also entrepreneurs, job-creators and managers of high-levels of economic productivity in small communities who receive almost no assistance from the state or from business.

The *zamazama* are also not the poorest of the poor, although most of them are certainly not rich. Many illegal miners that we have begun to get to know through our research are bright, motivated young men who are making a decent living for themselves. Some, indeed, have grown relatively wealthy and all support families. Unlike government that merely promises jobs, or industry that sheds jobs annually, each of these miners creates not just their own jobs, but also provides employment or sustenance for probably 10–20 other people in their communities. They are genuine entrepreneurs in a society that has been chronically unable to generate much entrepreneurial spirit.

Indeed, many of the miners are from Zimbabwe, Mozambique and Lesotho, among other southern African countries. These miners often work closely together with South Africans of many backgrounds. As is the case on the formal mines, teams are often composed of people from the same locations, or who speak the same language. In some cases, the artisanal miners are groups of brothers, or even whole families, women and children included. One Zimbabwean family lost six members in one episode in which

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up to 40 miners died underground at Roodeport on 1 March 2014. A week later, members of the family who had come from Zimbabwe took the bodies back with them after carefully 'gathering' their spirits in branches for the trip home. They, and other families whose members had died in the same incident, returned with the bodies of their family members in nine combi taxis. When they arrived home to bury the six bodies, they found that the ruling party in Zimbabwe had taken over the memorial service, with scarcely room for the bereaved family. Like South Africa, the issues around 'illegal' miners had been politicised.

For the most part, the illegal miners are not 'stealing gold' from the registered industrial mines. Most of the gold bearing ore that they mine is not exploitable using industrial methods. The *zamazama* exploit resources that are too shallow, or too lean for standard mining methods. They make up for this by their knowledge of the geology, selecting 'belts' (veins) that are likely to contain good grades and then hand select the richest rock. They often test the ore immediately, while underground, using simple crushing and panning methods. They follow veins with narrow drives that they dig by hand with spades and iron bars, but they also – dangerously – exploit the pillars that industrial miners leave behind to support the roof.

The principal danger for the illegals, however, is not the physical mining or its risks, but rather other people. The miners themselves are often mercilessly exploited by police, government representatives and criminal gangs. In some cases, they have been killed in large numbers. As the *zamazama* often have no formal training or even previous experience in formal, legal mines, they would benefit tremendously from some sort of training or organised 'knowledge transfer' of safe mining practice. In practice, however, this would be almost impossible to achieve since no formal organisation could bear the risks that this would imply. And their failure to adhere to safe mining practices is one of the reasons they can exploit otherwise risky, low-grade and near-surface deposits. It is clear from research so far that informal training and knowledge transfer does take place, but we have not yet discovered how this occurs. These miners say that the more critical danger comes from government departments and policing.

Their methods are contemporary, to be sure, but they bear striking resemblance to ancient methods that were around when the first gold was taken from the earth. Gold was first extracted and used around 4500 BCE in the region of the Black Sea, but was also independently discovered and utilised in South and Central America and the Caribbean from about 2000 BCE. Apart from the biblical accounts of the gold of Ophir, there is little evidence that gold was mined in Africa until 750 CE (Killick, 2012). There is ample evidence of gold mining in southern Africa from that time forward, however.

The artisanal miners of today have high levels of technical knowledge about extraction and processing of gold. They use local materials that, except for mercury, can be purchased at any hardware or grocery store. Their methods are simple and they use no more equipment than can be carried in one hand and fitted into a backpack. Armed with knowledge of extraction and processing, and a few simple tools, a small group of miners can extract gold and process it to pure metal. They do this with the help of members of their communities including women, youth and children. Complex communities of kin, neighbours and migrants participate in a complex chain of value. From the local extraction of ores to beneficiation and ultimately to sale of gold on world markets, miners, brokers, buyers, facilitators and many others are involved in a secret regional economy that draws from all parts of the southern continent. It appears, too, that most southern African 'illegal' gold is sold into informal and unregistered markets in Lebanon, Israel, Pakistan, India and China rather than into formal Euro-American markets. Although their knowledge and technology are local, the 'illegal' miners are an integral part of a vast global market that operates almost entirely outside of governments, financial systems, formal business and the media. This alone is a singular achievement.

Some elements of the artisanal gold miner's technology are literally Stone Age. Ore is crushed using hammer stones on exposed boulders or sheets of rock, usually just outside of the shaft opening that provides access to underground workings. This activity can be distributed around a wide area and utilise the labour of many part-time workers. It is not unusual to see groups of women carrying large hammer stones on their heads as they walk in friendly groups to work sites. Surface soils are also exploited, as is material from the earliest levels of mine tailings dumps that were deposited in the late nineteenth century before industrial miners learned how to fully extract the gold. Tools are sometimes fashioned from scrap iron that is forged on charcoal fires, just as the earliest blacksmiths would have done. Sluicing, buddling, settlement tanks, riffle plates, panning and assay techniques are similar to methods discussed in ancient texts and in Georgias Agricola's *De Re Metallica* of 1556 (translated from the original Latin by Herbert Hoover, a mining geologist who became the 31st President of the USA and who was one of the 'Americans' in Anglo-American) that describes mining and metallurgical techniques from Ancient to Mediaeval times. On the other hand, they use oxy-acetylene torches and mercury-amalgam refining techniques that depend fully on advanced modern technology. The blend of technologies, from Stone Age to modern industrial, is one of the most intriguing and creative aspects of the artisanal mining enterprise.

The ecological footprint of artisanal mining is astonishingly small, while its extent is remarkably large. Small-scale mining of this type does not produce large amounts of waste, since ore is visually sorted and subjected to simple assay methods before being transported or further processed, and waste streams are small. Although it relies in large measure on industrial mine shafts, galleries and adits, it contributes a negligible fraction of the deleterious waste produced by the latter. Artisanal mining, often illegal, is practiced all over the world today. In South Africa, in places such as Roodeport, Benoni, Barberton, and Welkom, this kind of mining covers large areas even though it remains essentially invisible to all but those who know what is going on, and what to look for.

At the same time, labour involvement in artisanal mining is exceptionally broad even though it requires specialised skills. Unlike industrial mining, there is no room for unskilled labour. As Agricola remarked in 1556, many people "hold the opinion that the metal industries are fortuitous and that the occupation is one of sordid toil, and altogether a kind of business requiring not so much skill as labour" (Hoover translation). But as Agricola is one of the first to show, mining of any kind requires many skills. Risk can be reduced by mechanisation and engineering, but for the small-scale artisanal miner it is often inescapable.

The illegal miners work in small groups of 5–15 men. More than this number, they claim, leads to internal conflict. Teams often include people from many ethnic, linguistic or national backgrounds. Usually several teams work together in mines that they know well, and shifts can last up to a week or more underground. A leader helps to provide material and tools, and assists in selling the refined gold produced by the teams. Such a person also provides a place of safety where miners can store their personal possessions (cell phones, ID books, money, clothes) whilst they are underground, and usually brokers payouts and divisions of food or other resources to the teams. Leaders also provide religious services and arrange contracts with *sangomas* ('traditional healers' or 'shamans') to supply medicines that protect the miners while they are underground and that help them to identify dangers. Some, indeed, are also prophets or priests themselves. Open-air

churches and shops selling protective herbs and amulets are a feature of these mining landscapes since miners and their families wish to acquire blessings and spiritual security in this dangerous business.

Once the concentrated ores reach the surface, or are collected from surface mines, they are first pulverised. Teams of women usually carry out this task. Initial assays are done on the spot with a simple enamel pan and water. Women and children also carry water for initial washing of ores. Washing sluices and riffle plates are set up in streams or in mine run-off channels in the Roodeport area. These are temporary structures are made of waste timber, plastic sheets and earth. A range of other enrichment techniques is then applied. Eventually, enriched slurries are mixed with mercury until hard balls of Au–Hg amalgam are obtained, and the mercury is burnt off, leaving reasonably pure gold.

It is not yet clear where this knowledge comes from, but since illegal gold miners are connected with their counterparts in a global economy, knowledge is also circulated globally. The technologies and methods applied by the illegal miners have almost no overlap with the formal industrial mining practices. It seems, too, that the illegal miners are not unemployed miners from the industrial mines. There is some interaction between the two communities of miners – one formal and legal; the other artisanal and illegal – but for the most part they constitute quite separate communities with different sets of knowledge.

But it is also clear that some of the 'illegal' knowledge and methods may have deep historical roots in southern Africa. Africans were mining well before European miners arrived, and hundreds of kilograms of gold was shipped from ports along the Indian Ocean from 750 CE to 1500 CE. Hard-rock industrial mining, derived primarily from practises of earlier small-scale artisanal mining technologies developed in Cornwall, UK, has erased much of the last evidence of indigenous African mining. Except as labour, the role of Africans and African technologies in the earliest mines in southern African has also been forgotten. But it is eminently possible that elements of the earlier African mining heritage are partly preserved in artisanal and 'illegal' mining practices. If so, this constitutes an important part of South African national heritage and must be supported.

In sum, then, the illegal, 'small-scale' artisanal miners, or *zamazama* provide significant levels of economic activity, support considerable numbers of people in communities who receive almost no support from elsewhere, and embody skills and knowledge that is found nowhere else in South Africa. They are not a threat to industrial mining, but take risks that registered legal mines would not, and should not, take. However, the primary threat to their lives and livelihoods is not the risk of mining, but from other people who steal from them directly, or who simply make their lives much more difficult than they need to be. They are a valuable part of the regional economy, and a part of the southern African cultural and national heritage.

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