

# MINING & TRADE *Review*

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Mining & Business News that Matters

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# Gold mining stampede

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- illegal miners defy government stop order
- death of miners jolts authorities into action

By Chiku Jere

**A**rtisanal and small-scale miners (ASMs) who are mining gold in different areas of the country have defied an order from the government to stop the illegal mining activities, which have been associated with a myriad of health, social and environmental problems.

Gold panning is mainly taking place in Nathenje River in Lilongwe, and a number of rivers in Makanjira including in Namizimu Forest Reserve in Mangochi.

The unlicensed ASMs are also mining gold and other precious stones in Linthipe in Salima, Balaka, Ntcheu and Mzimba.

The Ministry of Natural Resources, Energy and Mining issued a strongly worded Press Statement in local newspapers warning individuals engaged in the illegal mining activities to stop the ‘malpractice’ or face eviction and prosecution in accordance with the laws of Malawi.

“The Ministry would like to inform the public that exploration, mining, and trading of mineral products without valid license issued by the Ministry is punishable offence as stipulated in the Mines and Minerals Act (1981),” said Principal Secretary for the Ministry, Patrick Matanda in the statement.

He also quoted the Forest Act (1997) which prohibits exploration, mining, settlement and cutting down of trees in forest reserves without a licence from the Forestry Department, saying any activity currently happening in protected areas such as Namizimu Forest Reserve is against the law. *...cont. on pages 4*



Who said women are weak? A female miner in thick of things



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## Mining taxation knowledge crucial for media - Oxfam



Members of the media attending mining taxation training

By Gloria Mbwana

There is need for media practitioners to broaden their understanding of taxation issues involving the extractive sector in order to effectively play their role of promoting transparency and accountability in the industry.

This observation was made at a capacity building workshop for media practitioners on fiscal modeling for the extractives sector, which took place recently at Linde Motel in Mponela, Dowa.



“As media practitioners, you cannot competently report on taxation issues in the extractive sector without going through the relevant clauses in the constitution, which guide individual legislation of the land. Oxfam organized this workshop to deepen your understanding on these issues,” said Workshop facilitator Fredrick Chanza, an expert in mining taxation.

The function, which was interactive, tackled, among other things, Malawi's taxation legal framework as it relates to extractives, the nature of extractives sectors, as well as financial and fiscal modeling in analysing extractives contracts.

The participants were also drilled on how to read mining contracts and understand fiscal modeling for oil contracts in order to report effectively.

Chanza explained to the participants that in order to understand the issues of taxation in extractives sector, media practitioners have to get accustomed to relevant legislation.

He took participants through analyses of Sections in the Constitution of Malawi which deal with fiscal issues, particularly Sections 171 and 172, explaining that these two, backed by other specific Acts, set legal requirements for tax collection, management and allocation.

Chanza also drilled the journalists on the Public Finance Management Act which governs economic and financial management including adherence to policy objectives and the budget.

The Act, among other things, provides that only the Minister of Finance is in charge of taxes and any contract agreement between the government and a mining company must be in adherence with the law.

Freelance journalist, Watipaso Mzungu who was among the participants, thanked Oxfam for organising what he called a very important, helpful and eye-opening training workshop for the media but observed that one day's time was not enough for the participants to absorb complex issues that were presented at the function.

The journalists recommended the need for Oxfam to organise another function that will include practical sessions and visits to mining areas.

“For example in Malawi we need to visit Kayelekera where there was controversy on how much the government was collecting revenue in form of taxes and what benefits accrued for the nation and the community,” said Mzungu.



**From page 1** The Ministry gave the miners July 20, 2018 as the deadline to stop the activities and urged the public to report any suspected illegal mining practices to the Ministry's headquarters, Departments of Mines, Forestry and Geological Survey, District Commissioner's offices and law enforcing agents.

It also urged local communities to desist from encouraging the malpractice through provision of shelter, food, labour, selling of merchandise and providing mining plots in their land to the dealers.

But *Mining & Trade Review* has established that despite the threats from the government, the miners are still continuing with the illegal activities, which have attracted buyers from different countries including Tanzania, Mozambique and Zimbabwe.

Efforts to get a comment from Mines Department on the issue on what measures the government will deploy to enforce the stop order proved futile, as Director of Mines, Jalf Salima, was reportedly out of office.

But speaking to *Mining & Trade Review* in a telephone interview, ten days after the deadline, Gemstone Association of Malawi (GAM) Central Region vice secretary, Percy Maleta, who is also Chairperson for Nyasa Mining Corporative, confirmed that the miners are still on the sites.

He said the stubborn miners have mainly intensified their activities in Nanthenje and Makanjira, and it will be very difficult to stop them by force saying the only way to bring sanity over the issue is to regularize the activity by training the miners, issuing them with proper licences, and monitoring their work as the scenario is in other countries.

"We are yet to get off the ground in Malawi. Makanjira in Mangochi, Lisungwi in Balaka, Nanthenje in Lilongwe has over 5000 gold miners (illegal) all given a deadline of 20-07-28 to vacate the land. As of last week (past the deadline) Nanthenje Lilongwe had well over 50 gold buyers (illegal) managing an average of five grams per person per day. Mangochi on a good day produces a kilogram from well over 2000 gold panning army," said Maleta in a Facebook post.

The illegal mining activity started in Nanthenje a few months ago but has been happening unabated for some time in the other areas.

The government's stop order came after three Lilongwe women lost their lives along Nanthenje River banks following the collapsing of the land where the three were extracting alluvial gold dusts as well as rhodolite.

Lilongwe Police spokesperson Kingsley Dandaula was quoted by *Malawi News Agency* (MANA) as having identified the deceased three as 26 year-old Rosemary Chimbereko and Mtamandika Chipira 43, both of Mazinga Village, and Rofina Jackson aged 36 of Kachikho Village, T/A Chadza.

The police publicist said the three were buried alive in the course of digging the river bank, and efforts by their friends to rescue them proved futile. Postmortem results revealed suffocation as the cause of death.

*Mining & Trade Review* crew's visit to several of these mining spots revealed extreme extents individuals are prepared to go just to eke a better living from the activity despite the risks.

At Nanthenje mining spot - Lumwira and Dzondi Villages T/A Mazengera - the crew found about 3000 people - men, women, boys, girls and families- toiling; determinedly digging, shoving, head-carrying bags and tins full of supposedly gold-rich soil and panning, just to get their hands on the prized minerals.

Maxim Sam'mange, his wife and son who migrated from Nsanje were among those found panning gold from a pile of soil the family had dug and ferried to the river from a distance of about three kilometres.

"It all started when my wife got wind of the trade and convinced me to come and invest in the venture. I have never regretted doing so because though the work is tough, we have struck gold here and we are getting instant reward

for our sweat unlike other business ventures which require you to toil for ages to start earning something tangible," said Sam'mange.

Asked where he learned the gold panning art, Sam'mange said free training is provided right on the spot by fellow miners well versed in the trade.

Gifton Brighton, a young man from Tsabango Village, said he rushed to join the free-for-all mining jamboree following a tip from a friend.

"I was in Mozambique working but when I heard that people were mining gold I decided to leave my job and rush back home to join the party since I had an idea regarding the profitability of the undertaking having previously taken part in similar activities in Nanjiri River," he said.

According to the miners, the proceeds range from K100,000 to K200,000 in every three days, but when luck strikes, one can cart home in excess of a K1 million or two in a day.

They get the "gold mine," which is a small plot of land where one digs and searches for the prized mineral, on lease from villagers at prices ranging from K3000 to K20,000, depending on the size of the plot, but the money is paid after the soil has been sampled and its mineral containment has been proven.

Jacqueline Bwanali from Lumwira Village T/A Mazengera is one of such land owner who professed to have benefitted from leasing out land plots in her garden to the illegal miners.

"As you may know, this is farming off-season; most of us are preparing for the next season and the money we have realised from hiring out these pieces of land will assist in purchasing farm inputs such as fertilizer, seeds, among others," she said.

But Consulting Geoscientist, Ignatius Kamwanje, said despite such gains for the miners and landlords, the practice immensely contributes to environmental degradation and numerous social problems.

"The undertaking has adverse effects on land and water resources (surface and groundwater), air quality as well as



**Total chaos as illegal miners put the land under siege at Lumwira Village**

causing noise and earth vibrations through use of tools, equipment or machinery," he said.

The expert said this affect miners directly because they mostly do not use safety or monitoring equipment to reduce the effects and determine the extent of respective impacts.

He also said mine waste materials including waste rock (gangue) and tailings (fine-sized materials left after processing), are often dumped in and around mine sites and with time, these materials break down as a result of interaction with water, air and organisms to release various elements/substances such as mercury, arsenic, cadmium and lead which are toxic, contaminate the surrounding environment or may be healthy hazards.

In previous times, deaths due to illegal mining practices that are conducted without any safety measures were also reported in Salima and Makanjira.

Deputy Director of Mines, Atileni Wona, reportedly told *Mining & Trade Review* that lack of toilets at the illegal mining sites is another major concern which may lead to the spread of diseases such as cholera.

Wona said there is also danger of prostitution and spread of HIV/Aids at the mining sites as some of the miners migrate to camp at the sites leaving their spouses at home ■



By James Kazembe

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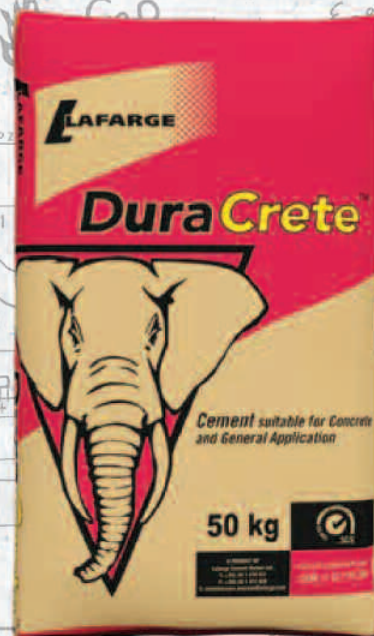
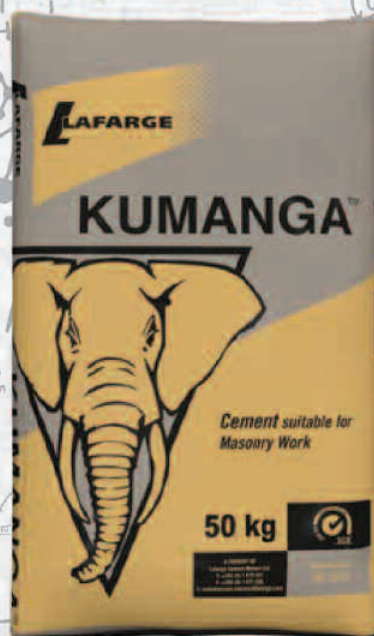
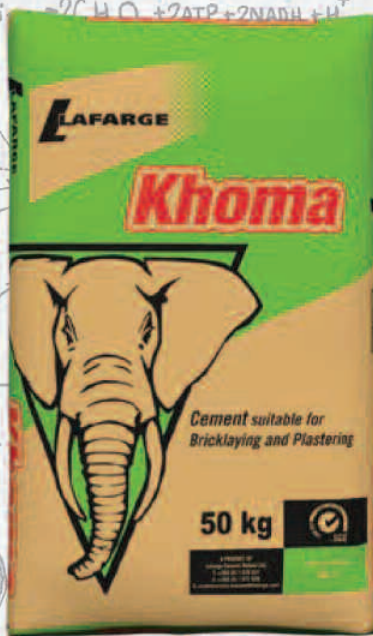


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## EDITORIAL

BY MARCEL CHIMWALA,  
PUBLISHING EDITOR

## Need for action not rhetoric on illegal gold mining

It is a fact that Malawi has become a haven for gold dealers from the region who are camping in gold panning hotspots to buy the minerals from artisanal and small scale miners (ASMs).

As reported in our lead article, customary land owners in gold panning sites such as Nanthenje River Banks in Lilongwe, Makanjira and Namizimu Forest Reserve in Mangochi, and Lisungwe in Ntcheu are cashing in on the practice through renting their land to the ASMs.

Government, which is mandated to license ASMs, has described the practice as illegal.

In a Press Release, the Ministry of Natural Resources, Energy and Mining sternly warns individuals engaged in illegal mining activities to stop the 'malpractice' or face eviction and prosecution according to the laws of Malawi.

In the statement signed by Principal Secretary Patrick Matanda, the Ministry stresses that exploration, mining, and trading of mineral products without valid licenses issued by the Ministry is a punishable offence as stipulated in the Mines and Minerals Act (1981).

It also quotes Forestry Act (1997) which prohibits exploration, mining, settlement and cutting down of trees in forest reserves without licenses from the Forestry Department, saying any activity currently happening in protected areas such as Namizimu Forest Reserve is against the law.

The Ministry further urges local communities to desist from encouraging the malpractice through provision of shelter, food, labour, selling of merchandise and providing mining plots in their land to the dealers.

It puts July 20, 2018 as deadline for the miners to stop illegal mining activities.

However, some weeks after the deadline, illegal gold mining activities are still taking place in these hotspots where thousands of people, including vendors selling their merchandise, have camped.

As reported in our lead article, there are several risks associated with this practice including safety of the miners, who are conducting mining activities without any safety measures.

There are also risks of conflicts and fights among the miners, tuberculosis, HIV/Aids, and diseases that may arise due to poor sanitation such as diarrhea as the sites have no toilets.

We, therefore, feel it is imperative for the government to take action against these miners. However, we feel the right action is not bringing the miners to the court of law as the Ministry says in its Press Release but rather what the Chairman for Nyasa Mining Cooperative Percy Maleta says in the lead article which is to regulate the activity by training and licensing the miners, and ensuring that government collects taxes from any sales of the minerals from these sites.

We feel as a country, Malawi is losing considerable revenue because of its failure to regulate the ASM sector which is one of the largest employers in the country.

In this vein, we urge the government to be serious in managing this sector by adopting the ASM policy, which will act as a guideline to manage the subsector, enacting the New Mines and Minerals Law and scaling up enforcement of laws and regulations to do with ASM operations.

Certainly, foreign unscrupulous mineral dealers will always take advantage of a disorganized situation where the laws are archaic and enforcement is difficult, and national mineral exploration programmes are not up to date due to inadequate funding to institutions such as Mines and Geological Survey Departments.

There is certainly a need for action and not mere rhetoric from Capital Hill to address this problem of illegal gold mining, which is putting lives of a good number of impoverished Malawians at risk and contributing to loss of revenue that government would have earned in form of license fees and taxes ■

## MITC partners EDF in Export Development project



Malawi moves to add value on exports

## By Our Reporter

Malawi Investment and Trade Centre (MITC) has partnered Export Development Fund (EDF) in implementing the Export Development Project, which will promote value added exports through the provision of financial, technical and trade facilitation services to Malawian businesses.

The project was presented at this year's Malawi Investment Forum, and EDF and MITC say came about on the background that Malawi has for a long time relied on primary level exports which fetch less on the market as opposed to valued added exports.

"The project aims to promote the generation of foreign exchange through industrialization by facilitating production of value added products in order to stir economic growth and reduce poverty and this is intended to result in diversification of the export base and reduction of imports thereby ensuring an increase in foreign exchange generated," EDF and MITC say in the project document.

They explain that the project's specific objective is to enhance production of value added products for export markets through provision of finance, targeted trade promotion activities, generation and dissemination of export opportunities information and facilitation of business linkages programs.

The project also seeks to enhance quality of

value added products for export markets through provision of finance and technical assistance like training programs, in all necessary value chain structures.

"The project aims at working with Malawian owned businesses in the sectors and sub-sectors of agro-processing; processing of cooking oil, honey products, dairy products, meat and poultry, beverages, peanut butter, cereal products, canned products, chilies and spices, and processing of any agricultural product," states the project document.

The project is also targeting the textile and leather sector in production of industrial wear (work suits, uniforms and boots), garments, footwear, fabric, cotton yarn, or cotton lint, and other light manufacturing products like furniture (including cane chairs), packaging materials (bottles, cartons, sacks, and carrier bags), sanitary wear, cosmetics, toiletries, ceramics and pottery.

The Export Development Project will as well focus on the jewelry making sector which includes artisanal mining, cutting and polishing of precious stones.

The other area of focus for the Project is the electronics and assembling of parts including cell phone and computer assembly, electrical appliances and fittings, motor vehicle and motor cycle assembly, batteries and solar equipment.

The project will run in three year cohorts with participants being fully weaned off by the end of the cohorts, and selection into the project is through submission of applications by interested companies ■

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# New coal mine launched in Karonga

...“Kasikizi set to become Malawi’s largest coal producer” ...Consortium mulling over plans for 50MW power station



Dignitaries joined by Indian High Commissioner (2nd R) during launch

By Marcel Chimwala

A consortium of local and Indian investors has partnered a local firm Zagaf Cement to launch the Kasikizi Coal Mine in Karonga, which it plans to develop into the largest supplier of coal in the country.

Managing Director for Kasikizi K.S. Gurulingaswamy said at the commissioning ceremony of a new coal crusher at the mine, which also marked the official launch of the mine located in Group Village Headman Mweninguwe’s area, that Kasikizi will produce 20,000 tonnes of coal per month.

He said the consortium is also planning to set up a coal fired power plant with a capacity of 50MW, which will be supplied to the national power grid.

“We need support from all stakeholders including the government, traditional leaders and the local community to enable this important project succeed. We are proud to be in Malawi, we are proud to be in Karonga,” said Gurulingaswamy.

Another Director for the company, Grain Malunga, told

the gathering that he is excited that the project which he has worked on as a geologist has culminated into a coal mine.

Malunga explained that Zagaf Cement Sales, which holds minerals rights for the area, initially started exploring for limestone but after extensive studies discovered that it is not suitable for cement production as it contains a lot of dolomite.

He, however, said during the exploration work, he discovered that the area has a sizeable deposit of coal, which prompted them to seek a go-ahead from the Department of Mines to add coal into the exclusive prospecting licence.

Malunga said subsequent exploration work has proved that there is quality coal at the site which is very much better than Mozambican coal, being dumped in the country.

He explained that overdependence on coal imports is not sustainable as it is a drain on foreign exchange which can be used on other important commodities.

Another Director, Aslam Gaffar, agreed with Malunga saying it is unfortunate that despite having proven coal reserves, Malawi continues to drain the much-needed foreign exchange through importation of coal from neighbouring

countries such as Mozambique and Zimbabwe.

He cited his company, Cement Products Limited (CPL), as a major consumer of imported coal revealing that it uses 3,000 tonnes of coal per month.

Gaffar, who holds 35% shareholding in the new Kasikizi venture through Zagaf Cement Sales, said the opening of the new coal mine, therefore, gives CPL a local source of coal, which is important for import substitution.

“Of course, the distance is long from Kasikizi to Mangochi but we have devised a way to cater for that. Thus trucks coming to supply CPL cement to Karonga will be coming back to Mangochi loaded with coal. We do not have to import everything when we can source locally,” said Gaffar.

In his speech, Deputy Director for Mines Department Peter Chilumanga who represented the Malawi Government at the ceremony said as a facilitator of investment, the government is more than excited to see the Kasikizi investment culminating into something big for the local and national economy.

“We are more than excited because the mine has already started employing local people in so doing contributing to rural development, and will provide taxes and royalties to government,” said Chilumanga.

He said the government also welcomes plans by the investor to establish a thermal power plant as this will help the government overcome power outages which have a knock on effect on all the sectors of the economy.

Chilumanga asked the investor to observe safety and environmental protection measures in operating the mine.

He said: “We would like to encourage you to operate as safely as possible by following all safety and environmental protection guidelines and regulations.”

“You also have to consider to go beyond mining and energy production and look at other alternatives such as the possibility of producing briquettes for domestic use to avoid environmental degradation.”

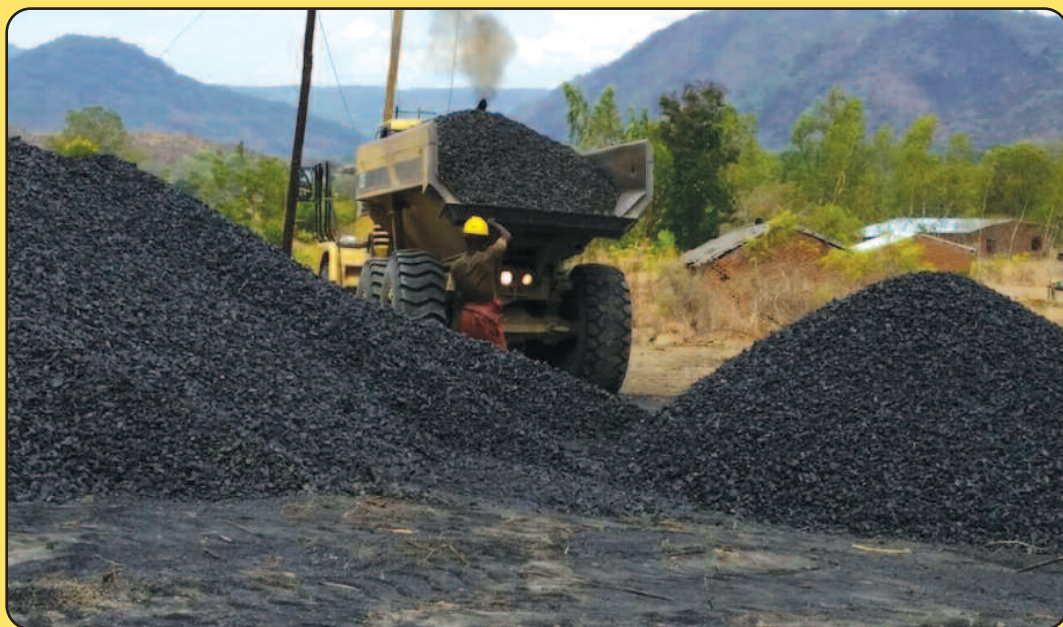
Chief Kyungu asked the investor to desist from exploitation and ensure fair treatment of the local employees and the surrounding community.

He also appealed to the Malawi Police Service to provide security to the area including the equipment brought by the investor.

Indian High Commissioner to Malawi Suresh Kumar Menon said the Indian Government is delighted to see Indian and Malawian investors partnering in such a significant mining project.

Menon said: “Such a partnership is a symbol of strong ties existing between India and Malawi.”

“As India, we want to take our interest in Malawi minerals to a higher level since we are one of the greatest consumers of minerals in the world.” ■



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By Gloria Mbwana and Wahard Betha

Though the government has declared the gold mining stampede in different areas of the country as illegal, it has not stopped stakeholders carrying sensitization campaigns for next year's tripartite elections from taking their messages to multitudes of people at the mining sites.

*Mining & Trade Review* captured a poster by the National Initiative for Civic Education (NICE) at Dzundi mining centre in the Nanthenje River Banks urging the people who are busy with gold mining operations to take their time to register for the elections.

The Malawi Electoral Commission is conducting the registration exercise in Lilongwe urban and rural starting from July 30 to August 12, 2018 which marks the third phase of the exercise.

Festoon Banda, a vendor at the market centre established at the mining site, said the NICE officials conducted a meeting at the site urging the people to spare time and go to their respective villages to register and vote.

Malawi will hold tripartite elections on May 21, 2019 in which State President Arthur Peter Mutharika of the ruling Democratic Progressive Party (DPP) faces mounting challenge from opposition candidates including leader of opposition in parliament and President of the Malawi Congress Party (MCP) Lazarous Chakwera, former president Joyce Banda of People's Party and State Vice President Saulos Klaus Chilima who has just launched his United Transformation Movement (UTM)

Chilima has launched his party in all the three regions starting with the Central Region where he held a rally at Masintha CCAP Ground in Kawale, Lilongwe promising good trade policies that will include securing profitable markets for agricultural commodities.

He also pledged to encourage cooperatives and empower more women and the youth to invest in businesses.

The UTM president promised to create employment opportunities for at least one million youths through the resuscitation of factories and companies that closed due to poor government policies.

He also pledged to eradicate power shortages that the country is currently facing.

On the other hand, President Mutharika's administration is busy enticing voters to give it another term saying it

# Election messages get to illegal mining area



Nice poster urging people to go for voter registration

continues to succeed in implementing a number of development projects such as road construction across the country.

The administration cites the construction of the Thyolo-Makwasa-Thekerani-Mankhanga, Zomba - Jali - Phalombe - Chitakale, Kwanyanda - Santhe and Kwanyanda - Kasiya spur, Mzuzu - Nkhatabay, Liwonde - Mangochi, Thabwa - Chitseko - Seven, dual carriageway from area 49 - Area 18

- Parliament Roundabout in Lilongwe city, the Karonga-Songwe Road, Njakwa-Livingstonia, Maselema to Chiladzuru turnoff dual carriage way, Chikwawa - Chapananga - Mwanza, Lilangwe-Chingale - Machinga, Ntcheu - Tsangano-Neno-Mwanza, Jenda - Edingeni, Kawere - Mkanda in Mchinji and Rumphi-Nyika-Chitipa and Hewe Roads as some of the notable road projects it is implementing.

Mutharika's government also says it has come up with ways to address the prevailing power crisis, which include construction of new power stations on Shire River and a coal fired power station at Kammwamba in Neno.

The government is also facilitating the Malawi - Mozambique and Malawi -

Zambia Interconnectors.

In his 2018/19 budget statement, Finance Minister Goodall Gondwe said feasibility studies for the Malawi - Mozambique Interconnector have been completed and the Project is expected to reach completion in 2021.

"As for the Malawi-Zambia Interconnector, the feasibility studies are still underway," said Gondwe ■

## Vendors cash in on illegal gold mining

By Gloria Mbwana

A good number of vendors in Lilongwe have taken advantage of illegal gold mining activities taking place in the district by moving their merchandise to establish an informal market at the site.

A vendor selling food items whom *Mining & Trade Review* interviewed at the site explained he has been attracted to bring his merchandise to the informal market after he observed that mining activities are attracting multitudes of people.

"My business has improved since I moved my merchandise to this site. This activity is a big deal for us as these miners who are coming from different areas both within the country and abroad require a number of commodities for their day to day lives, which we, Lilongwe vendors, are able to supply at good prices," said the vendor identified as Festone Banda.

Another vendor Hyson Williams, who is a native of the mining area, said the gold mining activities have improved his economic status as he has dealt away with idleness by engaging in selling of clothes to the miners.



Vendors selling merchandise

"Not long ago, some of us young men depended on our parents for survival. The gold mining activity has dealt away with this dependency syndrome as it has given us the opportunity to venture into different businesses at the mining site," said Williams.

He also said the mining activities has given the people of the area an alternative to diversify from their over-dependence on small-scale agriculture for their livelihood.

Williams pointed out that agriculture is a seasonal



Even make-shift restaurants have sprouted out

engagement which necessitates the need for the villagers to engage in mining or vending at the mine to supplement their agricultural earning.

"In this area, we depend on the growing of maize and groundnuts for consumption and for sale to meet our basic needs. However, the earnings are not enough to cater for the whole year which has prompted us to venture into alternative activities at this mine," Williams explained to *Mining and Trade Review* ■

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## Mineral Resources, Orebody Models, Deposits and the Stock Exchange

**E**xploitation of a mineral means digging into the earth to find a mineral for which people will pay a lot of money. If the minerals exist in quantities large enough to be considered worthy mineable, then this is referred to as a “resource”. But public companies cannot talk about resources until they have developed a model and use appropriate geostatistics to qualify the model and the grade and tonnage estimate calculated from it. Geostatistics is the art of applying specialized statistical methodologies to predict the value of something in three-dimensional space based on the values of that something located more or less close to the point of interest.

### (a) Mineral Resources

A resource can either be huge or small. But the most important question is; does it contain enough minerals at a high enough grade to become economically mineable? This can be packaged in such a way that it has to be attractive to investors. First, note that there are two aspects to a resource that are very important to their owners, stock exchanges and potential investors – the size (tonnage, volume) and the quality (grade). An assessment of both aspects is necessary to differentiate rocks from a resource. Therefore, a resource must be defined by its size and grade. If a prospector or a geologist says, he has found a huge deposit of a mineral say zinc, the most likely questions one/an investor will ask are how big and how rich the deposit is. A model of the mineral occurrence leads inevitably to a calculation of the tonnes and grade of the occurrence. This is called a resource estimate which then becomes a reserve estimate. In other words, mineral resource estimates are used to estimate mineral reserves. There have been stories of people who have lost a great deal of money because they didn't ask these important questions to get enough details before making a decision.

Naturally, geostatistics affirms that some resources are better defined than others and this makes definition of a resource conveniently to be divided into three categories; inferred, indicated and measured. However, a measured resource, by definition, means that the orebody has been sufficiently drilled and assayed to confidently calculate the tonnes and average grade of the deposit and normally a resource will be defined by a combination of the three categories (i.e. measured+ indicated + inferred). Ideally, the Mineral Reserve estimate of the Kayelekera Uranium Orebody in Malawi was arrived at by using measured Resources to report Proven Reserves and only Indicated Resources to report Probable Reserves. No Inferred Resources were used in estimating the Mineral Reserve and this was based on the assumptions that were put forward that time not forgetting a simplified project analysis based on pretax basis. In reality on the ground, one will find out

that the most important aspect to come up with such a combination of resource definition is drilling that entirely reduces the value of the deposit.

Resource definitions for the three categories described above are publicly quoted by exploration companies who trade on stock exchanges and must hire someone known as a Qualified/Competent Person who has particular qualifications to make the estimate of resources who swear under oath to be accountable if the estimate is not accurate to avoid shock and embarrassment.

When an ore is mined it is either mixed with waste material or else some of it is left behind. It is therefore recommended that a mining engineer should decide whether it makes more sense to leave some of the ore (recovery) or bring some of the waste (dilution). If the ores occur in layered formation or veins that are very thin, then it will be hard to keep it out which leads to more dilution. In reality, it means the plant will receive an ore of lower grade than anticipated. However, if the layers of ore are much thicker than the layers of waste, then probably a recovery problem persists because some of the ore is left behind in order to feed the plant according to need.

The determination of percent dilution and recovery is a value judgment based on the operating experience of the engineer doing the calculation and it can have a very significant impact on the economics of the final operation. In open pit mines it is relatively easy to come up with workable estimates for dilution and recovery but in an underground mine where the ore can collapse on its own, there is complexity. No one knows whether it is an ore or waste.

### (b) Ore body Models and Deposits

A Model can be defined as a functional idealization of a real-world situation used to aid in the analysis of a problem. As such it involves synthesis of available data and should include the most informative and reliable characteristics of a deposit type, identified on a variety of scales and including definition of the average and range of each characteristic.

To come up with a quantifiable model, availability of valid data is very crucial. This model will guide a mining company to estimate and quantify how much tonnage is sitting on the ground ready to be exploited. Therefore, some tools shall be needed to determine the reliability of the model based on time and space.

One of the aims of the planning stage is to identify areas for reconnaissance and to do this one must have some idea of how the materials sought relate to geological factors including geophysics and geochemistry. This is best achieved by setting up a model or models of the type of deposit sought.

In mineral deposit models there are two main types which are often combined; the empirical model based on

deposit descriptions and a genetic model which explains deposits in term of causative geological processes. The genetic model is necessarily more subjective but can be more powerful, as it can predict deposits not contained in the descriptive data base. Another type of model which is extremely useful for preliminary economic evaluations is a grade tonnage (Grade Control) model. This accumulates grade and tonnage data for known deposits and from this it is possible to estimate the size and grade of an average or large deposit and the cash flow if one was found.

If a model is more quantifiable, then the better and that is qualified by the type and quantity of data used to create it is perfectly valid. There is need to have consistent data points to create a significant model. It must be borne in mind that to come up with a significant model, geological, structural and the grade of such a mineral have to be collected and made readily available.

When a mining company estimates that it has discovered such million tonnes of an ore in an area, the most important aspects to validate such information is through involvement of a Qualified / Competent Person and whether it fits with the specific standard definitions of resource or reserve and if these are ignored, then one doubts where the company is up to.

### (c) Stock Exchange

Some exploration companies are bragged in presenting unrealistic resource figures sometimes in order to attract the attention of buyers of shares at the stock market. This has also an impact on a prospective investor. Others are cheated to buy shares at a stock exchange market from manipulated figures on measured, indicated or inferred resource by an exploration company. Similarly, some company employees themselves might be tempted to tamper with samples in order to increase the value of their stock. With officers and directors of the company responsible for the correct reporting of their exploration results at Stock Exchanges, the probability of this happening is diminished. However, to cover that possibility the Board of Directors of most public mining companies will insist on a third-party review of the corporate chain of custody procedures and may pay for third party check sampling and assaying to ensure that their employees are correctly fulfilling their responsibilities.

Stock exchanges require much more qualifying information prior to a mining company talking publicly of the model and the estimate of mineralization determined by the model. This is a very good for investors. When an exploration/ mining company is close to a major discovery, a decision must be made on what to do next. The stock price of the company will never be higher than it is now unless something new is actually found. In practice, mineral exploration discovery results are what makes an exploration company to have stock market price rise ■

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# Japanese contractor commences work on Tedzani IV



Egenco official explaining to President Peter Mutharika about Tedzani IV project

## By Wahard Betha

Japanese contractor, Mitsubishi Corporation, has kick-started construction works for the Tedzani IV Hydroelectric Power Project which is expected to add 18MW to the country's power grid.

Speaking in an interview with Mining and Trade Review, Public Relations Officer for the Department of Energy Affairs in the Ministry of Natural Resources, Energy and Mining Saidi Banda said that the contractor is on the ground and the project is expected to last 38 months.

Saidi explained that power utility Electricity Generation Company (EGENCO) is executing the project with financial assistance from the Japanese International Cooperation Agency (JICA).

He said the project will help to overcome power outages which are dwindling production in different economic sectors.

"The project will improve reliability of power as a result impact positively on industrial production, health, education and many other sectors," said Banda.

Malawi is experiencing serious power shortages which has prompted the Electricity Supply Corporation of Malawi (Escom) to embark on an extensive load-shedding programme to ration power supply.

In order to overcome the problem, the government brought in diesel generators, which Banda said have an installed capacity of 100MW to cater for peak periods.

EGENCO has a total installed capacity 351MW from its hydro-sources but is able to generate around 230MW due to low water levels on Lake Malawi and the Shire River which produce 98% of the electricity.

Saidi said such a production is far from satisfying the growing demand of electricity, due to a rapid increase in the country's population, estimated have escalated to 600MW.

EGENCO CEO William Liabunya said at the launching ceremony of the Tedzani IV that he was happy that after three years of preparations, the project is finally off the ground and at an opportune time to deal with the power crisis.

"This project is going to add on several projects that we are currently undertaking in the energy sector to overcome the power crisis," Liabunya said.

Tedzani Hydro Power Station is located on the Shire River. It currently comprises of three power plants (Tedzani I, II and III) with a total power generation capacity is 92.7MW.

With a mission to generate reliable, sufficient and diversified power for generations, EGENCO started its operations in 2017 having been founded in 2016 following the unbundling of the then ESCOM into two entities with the other one, Escom, responsible for power transmission and distribution ■



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# TECHNICAL FILE

by Grain Wyson Phillip Malunga FIMMM

Minerals, Geology, Environment & Corporate Affairs Consultant

## Reflection on the Minerals Sector in Malawi

### Abstract

The minerals sector in Malawi is at infancy stage. Most activities are at exploration stage and very few small scale mines exist. These cannot significantly contribute to national economic development.

The Civil Society needs civic education on issues related with benefit sharing in a country that is in the early stages of mineral resources development. Their contribution sustainable development partners is welcome and their advocacy should be constructive and evidence based.

### Introduction

The minerals sector in Malawi is grossly misunderstood. Many think that the sector is producing and there is a lot of illicit financial flows and the people are not benefiting from their mineral endowment. This paper aims at putting into perspective what is on the ground and what needs to be done for the sector to significantly contribute to the nation's Gross Domestic Product (GDP).

### Status of the minerals sector in Malawi

The last three years have seen contribution of mining to the economy at 0.9%. The contribution to the economy has mainly come from coal, limestone (for agriculture and cement), rock aggregate and semi-precious stones.

The minerals are for local consumption with the exception of semi-precious stones (gemstones).

The rock aggregate sector makes a significant contribution to the economy of the country. About 20 operating quarries for production of rock aggregate both at commercial and project level contribute around 3.0 billion Kwacha. A boom in the construction sector is steadily increasing revenue in mining and quarrying.

Coal has the potential to grow the economy through its use as a source of energy for agro processing and thermal power generation. Our coal fields require serious exploration and evaluation in order to promote energy generation mix and steam generation for agro-processing.

### Mineral Endowment

The minerals sector is at an exploration stage. This stage requires government to take the lead in undertaking grass roots exploration and mineral evaluation in order to attract foreign direct investment. Attractive discoveries can be put on auction for government to recover its grassroots investment. This is true with high value minerals that are sought in international markets. This category of minerals include gold, rare earths, uranium, graphite, and niobium. Other minerals government can give extra attention are strategic minerals such as coal, limestone, iron ore and rock phosphates. Coal, limestone and iron ore are needed for infrastructure development while rock phosphate and iron sulphites are agro minerals that can promote agriculture productivity.

An estimated resource of 800 million tonnes of coal is obtainable in the North and Southern Karroo basins. Out of this about 22 million tonnes have been proved to exist in a number of coal fields across the country. Much of the coal was produced from Mchenga and Kaziwiziwi coal mines. Other smaller contributing mines were Mini Jalawe Mine, Chombe Coal Mine and Nkhauti Mine.

The coal is mainly used for provision of energy for different production processes in the cement, tobacco, textile, brewery, food processing and ethanol industries.

The cement industry will see an increase in production through an expansion drive by Shayona Cement Corporation in Kasungu and Cement Products Limited in Mangochi that has completed construction of a modern clinker plant at Njereza. Cement production is expected to increase from 210,000 to 350,000 tonnes per annum. Shayona Cement Corporation is currently producing 650 tonnes per day while Cement Products Limited is testing its 1,000 tonnes per day clinker plant. Malawi is geared to produce about 600,000 tonnes of cement per annum.

There is an opportunity for lime production in Malawi. The market is soil conditioning, water treatment, construction, agro processing (Sugar purification), poultry and paint industries. The country produces about 3000 tonnes of slaked lime per annum and the remaining 40,000 tonnes is agriculture lime.

Malawi has seen a proliferation of civil societies fighting for natural resource justice. This is very interesting for a country that is at exploration stage. Most of these were born to fight uranium production in Malawi with funds from anti-nuclear lobbyists. These groupings have failed to justify their relevance in other sectors such as aggregate, coal and gemstone mining. They have often targeted foreign investors who are helping government to undertake grass root exploration up to bankable feasibility undertaking. It takes a period of up to 10 years to come up with an investment decision. This is a period of mapping, sampling and testing to assess viability of a mineral deposit. This is a normal process with no hidden motives as perceived by the Civil Society and other stakeholders.

The introduction of the mining cadastre system will help clean up the minerals data base. This will promote transparency in the issuance of mineral rights once the new Mines and Minerals Bill is enacted.

Recent improvement in stakeholder relationship has been noted through the establishment of Malawi Extractive Industries Transparency Initiative (MWEITI). This process has engaged the communities, Civil Society and Government in understanding the need to be transparent and accountable on issues related with fiscal policy and management. Improvement in community benefit sharing and social responsibility has been included in the new Mines and Minerals Bill.

### Advanced Exploration Projects

The country is geared to be a significant exporter of niobium, rare earths (lanthanides) and graphite. Globe Metals and Mining completed techno-economic and environmental feasibility study for production of niobium concentrate. The company is busy mobilising financial resources and forming strategic technical alliances to develop the deposit at Kanyika in Mzimba. The company will be a significant supplier of niobium in steel and space industry.

Mkango Resources is undertaking a bankable feasibility study and an Environmental and Social Impact Study for production of rare earths at Songwe in Phalombe. The company is ready to be an important supplier of heavy lanthanides for the electronic and renewable energy industry.

Bwanje Cement Company is at an advanced stage in the preparation of a bankable document for production of cement and chemical grade lime at Golomoti in Ntcheu. The company is busy talking to potential and technical partners to develop the deposit.

Optichem-Mota Engil Joint Venture is undertaking a drilling program on Nanthache Hill in Phalombe to increase reserves for phosphate-rare earths deposit. The project is geared to make Malawi self-sufficient in supply of NPK +S fertilisers while also supplying rare earths to electronic and renewable energy industry.

Sovereign Metals is undertaking a bankable and an Environmental and Social Impact Study for production of flake graphite at Malingunde in Lilongwe. The company has touted it as a world class flake graphite found in sapprolite and easy to mine and process.

### Future prospects

The Mining and Quarrying sector is estimated to grow at 2.3 % in 2018. This will come from coal and aggregate. The yet to be enacted Mines and Minerals Bill will boost exploration activities and the adoption of a computerised Licencing Management System. This will encourage transparency, accountability and implementation of a stable fiscal regime for the mining sector. Coal mining is expected to increase due to government's promotion of thermal power generation and opening of export markets to Zambia, Tanzania and Rwanda.

### Infrastructure

Access to mining projects poses a challenge where low value minerals are in remote areas and capital expenditure on roads and energy makes project not viable.

The mining industry is faced with energy crisis. Paladin Africa Limited went into care and maintenance due to increasing operating costs arising from diesel power generation. Interconnection with Southern Africa Power Pool (SAPP) through Mozambique and Zambia is seen as one of the solutions including thermal power generation using imported and local coal.

### Environmental and Social Issues

The minerals sector in Malawi faces an environmental challenge in artisanal and small scale mining in the areas of gold panning, coal mining and aggregate quarrying. Gold panning in Mangochi and Balaka is creating pits and trenches that are not being rehabilitated and streams are carrying heavy soil load that is affecting aquatic life. Deforestation and social decay is expected to grow if regulatory enforcement is not effected immediately.

Coal mining has the potential of polluting river water in North Rukuru, Chombe Catchment Area, North Rumpi River and, Kaziwiziwi and South Rukuru rivers. There is fear of increase of heavy metals and destruction of habitats for aquatic life if environmental monitoring is ignored. Parliament is expected to pass an amended Environmental Management Act of 1996.

Community benefit sharing and engagement have been included in the new Mines and Minerals Bill. The Geological Survey and Department of Mines have been structured or transformed to effectively manage issues related with Occupational Health and Safety in collaboration with the Ministries responsible for Labour and Health.

### Country Mining Vision

The African Mining Vision (AMV) got a boost in 2017 when the African Minerals Development Centre (AMDC) sponsored a Country Mining Vision (CMV) workshop for Malawi. Malawi responded by drafting a CMV which was synchronised with the Mines and Minerals Policy (2013).

This initiative will help Malawi link its minerals sector with local economic linkages including infrastructure development, local content and skills development.

### Health and Safety

Progress has been made in the promotion of Occupational Safety and Health (OSH). Ministries responsible for Health, Labour and Mines are promoting elimination of TB in the mining sector, encouraging TB and silicosis screening and facilitating compensation for those eligible.

The following legislation and policies guide the administration of OSH in Malawi:

- Mines and Minerals Act Cap 61:01 (1981)
- Explosives Act (14.01)
- Employment Act (1996)
- Labour Relations Act (1999)
- Workers Compensation Act (2000)
- Occupational Safety, Health and Welfare Act (1997)

### Conclusion

The minerals sector has the capacity to contribute to national economic development. New geo-resources data has been generated and institutional capacity has been enhanced through introduction of mining cadaster system and introduction of tertiary education to fill in skills gap. Community benefit sharing and stable fiscal regime will be operational after enactment of the new Mines and Minerals bill.

There is high probability that within the next four years Malawi will see significant contribution of the mining sector to its economy. The Civil Society Organizations should be a partner in sustainable development and not being used as a destabilizing element in the promotion of the minerals sector in Malawi. Meaningful economic development will come from local participation in mining and not fighting for community development programs and corporate social responsibility.

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# MINING & TRADE *Review*

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## Sovereign touts Malingunde as World's largest

By Gloria Mbwana

ASX-listed resources group Sovereign Metals, which is prospecting for flake graphite at Malingunde in Lilongwe, has described the resource as the world's largest reported soft saprolite-hosted graphite Mineral Resource.

Sovereign says in a press statement announcing an updated mineral resource estimate (MRE) for Malingunde that metallurgical test work has confirmed that a blend of saprock can be processed along with the soft saprolite material which enables the company to access additional soft material to that considered in its 2017 scoping study.

"The ability to process a blend of saprock along with the very soft saprolite allows a ~60% increase in high grade, low-cost material that Sovereign will consider as part of Malingunde pre-feasibility study. With this exceptional resource base, the company will now progress

rapid completion of the PFS, leveraging the project's inherent low operating capital and high margin potential," says MD for Sovereign Metals Julian Stephens.

He says the updated mineral resource estimate provides the basis for a future low capex and low opex natural flake graphite operation focused on the soft saprolite (clay)-hosted component.

Saprolite-hosted graphite deposits are sought after as they generally have lower capex requirements and low operating costs compared to hard rock graphite mines.

Stephens explains that Malingunde has the potential to be a world-class asset with the potential for low capital requirements, low operating costs and high revenues per tonne of concentrate, likely resulting in a high margin operation.

The metallurgical studies indicate that 81% of the total Mineral Resource (>4.0% TGC) and 88% of the high-grade (>7.5% TGC) component is now classified as Measured or Indicated.

There is also a high-grade component of 14.5Mt @ 9.7% TGC (saprolite + saprock) to provide the focus for the Malingunde pre-feasibility; a significant increase in tonnage driven primarily by inclusion of saprock material.

Metallurgical test-work confirms that the blended saprolite (~85%) and saprock (~15%) material does not require primary crushing or grinding, providing the potential for substantially reduced processing costs compared to hard rock deposits.

All planned mining inventory is within 35m of surface and will be free-digging with very low strip ratios, with the potential for very low mining costs.

Sovereign Metals is pursuing the Malingunde Project through its wholly owned subsidiary, Mc Court



Sovereign Metals MD: Stephens

Mining and studies undertaken to date indicate that the resource can yield approximately 44,000 tonnes of graphite concentrate per annum over an initial mine life of 14 years.

The company is also conducting environmental and social impact studies which include community consultations with local stakeholders on the way forward for the project.

Sovereign aims to complete all studies for the project towards the end of 2018 to decide whether the mine will be developed or not in 2019.

The primary end market for flake graphite is the refractory, foundries and crucible sector which consumed approximately 616,000 tonnes of flake graphite in 2016.

The majority of flake graphite is used to produce magnesia-carbon bricks used in the steel industry and a growing use of graphite is in the production of rechargeable lithium-ion batteries for laptops and cellphones.

Substantial increase in demand for graphite is also expected in the future for the growing electric vehicle market ■

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Malingunde graphite project's scoping study highlights

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