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Mining sector corruption

• Stakeholders call for strategic measures to loot out vice

By Bester Kayaye

Stakeholders in the extractive sector have called on the Malawi Government to expedite strategic measures to curb corruption, which is contributing to slow growth of the industry.

The call comes in the wake of corruption allegations leveled against Cassius Chiwambo a high ranking official at the Department of Mines and a Chinese investor who were caught in an audio clip discussing a deal on the renewal of a mining license for Ilomba Granite Mine in Chitipa.

In the audio clip accessed by Mining & Trade Review, the Chinese investor is heard making an offer of money totaling US\$300,000 (K225-million) to Chiwambo to be shared to a former Minister, Mineral Licensing Committee and himself in order to renew the license for the Chinese.

Anti-Corruption Bureau (ACB) Director Reyneck Matemba indicated that the Bureau is investigating the issue.

Chamber of Mines and Energy National Coordinator Grain Malunga commented in an interview that the extractive industry is one of the sectors that can tremendously contribute towards the country's economic growth having catered for up to 10% of gross domestic product (GDP) when the Kayelekera Uranium Mine in Karonga was on stream so it is important for government to guard against corruption in the sector in order for Malawi to reap adequate benefits from its mineral resources.



Matemba: ACB accessed audios

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...from front page

“Corruption is evil. The Chamber of Mines and Energy does not encourage its members to be involved in corrupt practices. We hear of alleged corrupt practices by non members because they have no technical and financial capacity to comply with existing laws and norms,” he said.

He proposed that the Ministry of Mining should encourage miners to be members of the Chamber in order to help foster integrity in the sector.

Lecturer and Head of Mining Engineering Department at the Polytechnic University Tiya Miki Haundi commented in a separate interview that there is need for collaborative efforts which should include the academia to overcome corruption in the sector.

He observed that the vice has slowed down development of the sector and leads to loss of millions of dollars of public revenue every year.

Haundi explained that the malpractice blows a big hole in the state coffers and diminishes the ability of the government to provide public services like healthcare and education.

He said; “We have heard of people from other countries coming in to smuggle our mineral resources each passing day. How do they acquire documentation to cross the borders? Are these foreign nationals brought to book when their names are mentioned?”

“If corruption in the extractive sector is not curbed, the country will continue to lose millions of dollars which would have developed the country including the mining sector.”

Haundi also said corruption has resulted in environmentally unsound and socially destructive mining projects being approved, rights to the country's mineral wealth being granted to unqualified or unethical operators, and politicians or government officials taking advantage of their positions to profit from their interest in the sector.

“Dubious people come in the country and get mineral licenses fraudulently while some deserving firms are denied the opportunity to acquire mineral licenses. These fraudulent people run away from implementing corporate social responsibility projects, let alone complying with environmental conservation laws. In this regard, local people do not benefit and the mining sector may not develop at all,” he said.

Haundi said there is need for the academia to join the battle against corruption in the sector from high chain of command stages to bottom by introducing courses that deal with mineral governance and legislation in the country's universities.

“This enables the students or upcoming graduates to be well aware of all the processes that are supposed to be followed when dealing with the mineral sector,” he said.

He also called on government to develop adequate regulatory frameworks regarding the mining sector and ensure transparency in contract negotiation and licensing processes.

“Government should make sure that land regulations are clear and accessible to local people. If the process for opening land to mining is not clear and transparent, the more likely it is that the decisions of government officials will be influenced by personal interests or favor certain parties in exchange for personal benefits,” Haundi said.

Chancellor College based mineral sector expert Dr. Charles Kankuzi expressed concern that some exploration projects in the country have stalled due to corruption.

Kankuzi said; “Academia must be directly involved in the fight against corruption in this sector. There needs to be mass sensitization about the impact of corruption to national development. There needs to be a very clear understanding that corruption derails development.”

“In order to ensure transparency and mitigation of corruption in the sector, the academia should be involved from the beginning and not only when things have gone out of hand.”



Kankuzi

Kankuzi also commended government on the plans to establish the Malawi Mining Investment Corporation (MMIC) to oversee operations of the sector saying; “like in many countries, the board to be set could positively contribute towards the affairs of the industry by taking a holistic approach that should promote the mining industry.”

“In fact the establishment of MMIC is long overdue. This should be the driving force for the advancement of the mining sector in Malawi. My only advice is that the board members should be chosen on merit thus should have outstanding professional record, free from corruption, hard-working and patriotic.”

National Coordinator for Natural Resource Justice Network (NRJN) Kennedy Rashid told Mining & Trade Review that corruption in mining sector has promoted inequality in terms of opportunities and has also introduced an unethical culture where by players no longer follow the law rather they follow individuals who have the powers to veto decisions

Rashid said: “This restricts local mining companies and ASMs to venture into mining as they do not have public connections and financial resources.”

“This has contributed to unequal wealth distribution in Malawi where by a few individuals with public authority are accumulating a lot of wealth at the expense of Malawians apart from contributing towards degradation of the sector.”

He said as NRJN they will continue providing checks, and generating and disseminating good governance data.



Haundi

We will also be publicizing and shaming culprits of all alleged corrupt practices and above all we will engage institutions of good governance to ensure that there is transparency and accountability

Rashid also said there is a need for the licensing process to adhere to principles of public procurement as well as legalizing the Malawi Extractive Industry Transparency Initiative (MWEITI) process to ensure that there is transparency in the sector.

“Governance institutions such as ACB, Ombudsman, Finance Intelligence Unit and even Malawi Human Rights Commission should play a role in the sector because we need to equip and capacitate Community Natural Resources Management Committees in mining governance.”

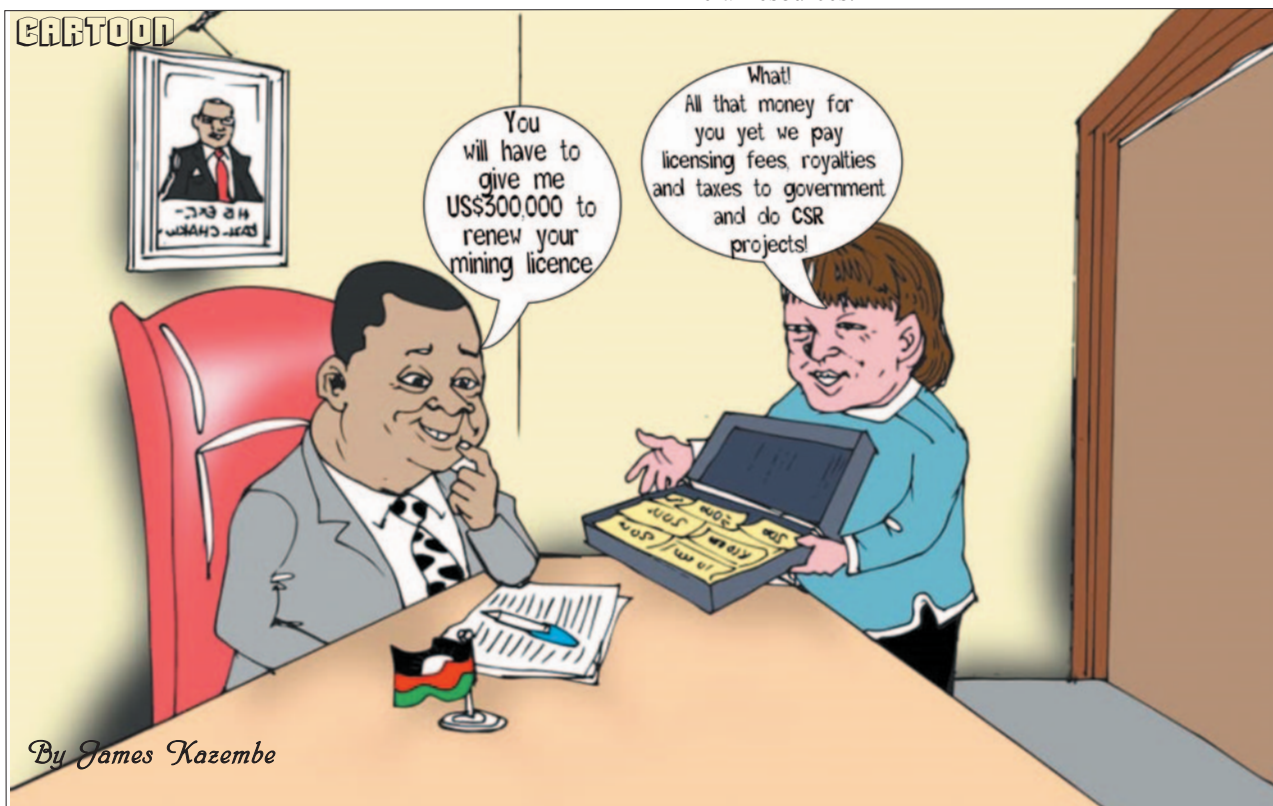
“There is also a need to advocate for an independent fund for government proceeds from the sector and not the Account Number 1 which is a general account”

President Lazarus Chakwera recently said Government is on the course of establishing the MMIC, to assist in regulating activities in the sector.

Chakwera hinted that the local extractive sector lacks a designated regulatory body to oversee and monitor processes and operations including issuance of licenses.

“Extractive sector is marred by many irregularities with many illegal operators acquiring mining licenses through illegal means, which is threatening our environment in one way or the other,” Chakwera said.

He said it is the objective of his administration to ensure that Malawians are primary beneficiaries of the country's mineral resources.



By James Kazembe



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EDITORIAL



BY MARCEL
CHIMWALA,
PUBLISHING EDITOR

Act on corruption to develop Malawi's mining sector

The audio clips in circulation depicting a conversation between officials of the Ministry of Mining discussing a deal with a Chinese investor for Ilomba Granite Mine in Chitipa for the investor to pay US\$300,000 and mobile phones to the government officials in exchange for the renewal of a mining licence is not only shameful but also disgusting.

We are not judges to blame any of the two parties for corruption but the issue remains that the fact that the two parties had the audacity to conduct those discussions is a clear manifestation that corruption is deep rooted in Malawi's mining sector.

As reported in our lead article, the Anti-Corruption Bureau (ACB) has taken up the matter after accessing the audio clips, an action which we find commendable.

But this should not end there. We need more action from stakeholders including government, mining companies, civil society organisations (CSOs), security agents and the academia to overcome corruption in the extractive sector.

As National Coordinator for the Malawi Chamber of Mines and Energy Grain Malunga is quoted in our lead article, mining has overwhelming potential to adequately contribute to economic growth as with only one large scale mine the Kayelekera Uranium Mine on stream, the sector's contribution to the economy surged from 1% to 10%.

However, this overwhelming potential cannot be fully realised by the country if corruption continues to take its toll in this lucrative sector.

Let us also mention that corruption is a disincentive to investment. Corruption results in failure of important projects which would have helped in attracting investment in the mining sector. In Malawi, there are questions on the failure to complete construction of the office complex to host the cadastral mineral licensing system in Lilongwe. Why did the contractor abandon the project? Responsible authorities have to take up such issues.

Corruption also overburdens investors with extra costs as they have to give money to government officials after paying licensing fees, investing in exploration, and community development projects as part of corporate social responsibility or community development agreements.

Corruption also results in conflicts over mineral rights. An example is the issue of the Kangankunde Rare Earth Mine in Balaka which is still idle, despite hosting one of the world's largest rare earth resources, due to court battles pitting government and investors.

It is also due to corruption that Malawi's precious minerals including gold are being smuggled hence the country is losing millions of dollars.

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Government pledges to transform ASM subsector

By Wahard Betha

The Ministry of Mining has pledged to work hand in hand with local artisanal and small-scale miners (ASMs) to transform the industry to ensure that it plays a huge role in alleviating poverty in mining areas and shoring up the national economy.

Minister of Mining Rashid Gaffar made the pledge when he officially opened the 2020 Small Scale Miners Conference at Bingu International Convention Centre in Lilongwe.

He urged ASMs in the country to work hand in hand with his Ministry saying doors are open for any discussion that will help in transforming the subsector and help to alleviate challenges ASMs are facing in their trade.

Gaffar said: "The Government recognizes the ASM subsector as a developmental aspect of economy. We are also quite aware of the challenges being faced."

"But to fight that common enemy, we need to join hands, my office is open. You can come to seek counselling anytime even without appointments."

He said the country has enough mineral resources to put Malawi on the map as a mining country if deliberate measures are employed to reform the sector.

"When the Ministry was bundled as Ministry of Natural Resources, Energy and Mining, it was not given much attention. But now as a stand-alone ministry (Ministry of Mining) it is possible to put Malawi on the map as a mining country," Gaffar said.



Gaffar keen to transform ASMs

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GLOBE METALS & MINING NEGOTIATIONS ON KANYIKA NIOBIUM PROJECT NEARING COMPLETION

Globe Metals & Mining Limited (“Globe”) is optimistic that the Kanyika Development Agreement will be finalised and executed this financial year.

In her 2020 Annual Report, Globe’s chairperson Alice Wong says Globe has maintained momentum in negotiations with Malawi Government on advancing the Kanyika Development Agreement.

“Notwithstanding the recent change in government in Malawi with the inauguration of H.E. President Chakwera in July, it appears that finalisation of the Kanyika Development Agreement with the Government of Malawi is nearing finalisation, and the Company is optimistic, based upon its dialogue with, and the responsiveness of key government officials, that the Development Agreement will be finalised and executed this financial year,” Mrs Wong declares.

Execution of the Kanyika Development Agreement is a pre-condition to the issue of a mining licence which Globe is reliably informed will immediately follow. Once the Kanyika Development Agreement is executed and the mining licence issued, the Company will be in a position to move forward with project funding (in the range of US\$210M to US\$230M for total estimated capital costs), and off-take arrangements.

“The Company’s Board and management is optimistic in realising project financing and development opportunities in the near term,” Mrs Wong states.

In a positive comment for Kanyika, Globe’s 2020 Annual Report references latest reports from the World Steel Association suggesting that global steel demand will recover in 2021 to near pre-Covid-19 pandemic levels, due to the expected faster recovery of China as compared to the rest of the world.

“As demand for higher quality steels rises as a proportion of total steel demand, and usage grows in the automobile and aerospace industries, particularly in China, India and Japan, the need for niobium is increasing at a faster rate than steel output,” chairperson Mrs Wong reports.

Despite the pandemic, analysts are still predicting that demand for niobium will grow at a compound annual growth rate (CAGR) of around 6% during the period 2020 to 2025.

Major factors driving the market are the increased consumption of niobium in structural steel due to its characteristics of tensile strength and durability (for use in bridges, buildings and other large constructions such as hangars and stadiums) and extensive utilisation of niobium-based alloys in energy-efficient buildings and infrastructure, and the manufacture of aircraft engines and automobiles.

Lightweight materials and designs have become increasingly important in the manufacture of automobiles, where driving dynamics is a major factor. Additionally, the emerging focus of governments across the world on minimising carbon emissions and enhancing fuel economy has increased the importance of lightweight materials in the production of automobiles.

“These combinations of growth and demand bode well for the price of niobium. As does the new emerging market of niobium in new technologies like wind turbines, medical imaging, particle accelerators, as well as an exciting development in the manufacture of high-performance and ultra-safe ultra-rapid rechargeable batteries for electrical vehicles,” Globe’s chairperson Mrs Wong concludes.

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MINING & SOCIAL ISSUES

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Significant Business Risks in Mining of Metals and their Implications

The mining industry has a reputation of being a risky business and careful considerations coupled with good management can see a positive impact in the business entity. Fluctuations in the risks may highlight ongoing disruption in the mining sector and it is worth noting that there are always opportunities in time of change. There are many risks that can be identified in mining of metals as a business but the most significant ones are outlined below:

1. Maximizing Returns

The long-term goal arising from mining of metals is to increase capital returns while reducing the volatility. Mining companies need to think more broadly about how to maximize their returns and adopt new approaches that may be radically different from those of the past. Mining companies will also need to re-evaluate their appetite for risk to ensure that they are not missing out any new opportunities by taking more conservative approaches to allocating capital. To achieve this, some areas that may be considered include the following:

- ✓ engaging in joint ventures.
- ✓ portfolio rethinking (change management, divestments, reconfiguring existing operations).
- ✓ engaging local content in other areas.
- ✓ funding transformation.

2. Social Licence to Operate (SLTO)

The term social licence to operate emerged from within the mining industry as a response to social risk. It refers to the ongoing acceptance and approval of a mining development by local community members and other stakeholders that can affect its profitability. License to operate and disruptions run through risks as social responsibility and broader stakeholder demands manifest. Social licence to operate can be considered as a routine part of doing business for mining and metals companies. The nature of the threat continues to increase and evolve and projects continue to be delayed or shelved completely because of conflicting community interests, with governments increasingly backing these communities.

In countries where there is political tension, transformation and unrest (no political stability), extended periods of elections, guerilla attacks and resultant government changes bring about uncertainty to the political environment of the country which creates volatility environment in the commodity/metal markets. In addition, the mining sector faces greater scrutiny from end consumers, demanding a transparent ethical supply chain as well.

Illegal mining activities also threaten a company's Social Licence to Operate, with poor conditions, dangerous practices and environmentally hazardous activities, continuing to threaten the health and safety of employees and local economies that can lead to mine closures. Activists with broad-ranging agendas are becoming more organized with advocacy on widely spreading anti-mining sentiment. Some governments are now giving greater powers to communities to make the final decision in approving mining and metals activities in their area. With billions of dollars in project investment at stake, ongoing engagement, collaboration and effective communication with all of these stakeholders is crucial and mutually-beneficial solutions are expected. The risk has become even more political, with many projects being abandoned or postponed due to an inability to obtain a social licence to operate.

3. Resource Nationalization

Resource Nationalization continues to form mandated beneficiation and tax transparency measures around the world and also continues to be an ever-changing risk to businesses though at a slower pace. It is the tendency of people and governments to assert control over natural resources located in their territory. This activity is being driven by the perception that mining and metal companies do not necessarily pay their fair share to host nations. It is a drive to combat corruption that has resulted in new transparency laws being enacted that allow companies to start reporting taxes and other government payments (Publish What You Pay). Mining and metal companies will need to ensure that they are ready for these new reporting requirements. Changes are made to reporting systems to ensure all data is collected and companies are happy with the story it tells. Organizations should take advantage of these changes to fully demonstrate the value they are adding back into communities, thereby creating a better understanding and slowing future resource nationalism activity.

In advancing transparency, the disclosure by extractive industry companies of payments made to governments is not new as the concept began with the Extractive Industries Transparency Initiative (EITI). The EITI goal is to enhance good governance of natural resource development through improving transparency and accountability in the extractive industries. Under EITI, companies publish (disclose) what they pay to a specific jurisdiction and the government publishes what it receives in a process that is overseen by a multistakeholder group of governments, companies and civil society. The new age of transparency means increased reporting requirements have left a number of sector participants scrambling to comply.

4. Workforce /Employees

Technological innovation has the potential to improve production, safety and environmental management in the mining industry.

To date, mining companies are still rethinking about the future of the workforce and the required skills. So companies are debating on whether to build skills using the already absorbed workforce or import. Given the competitive market for digital and data-related skills, the workforce might be hard to get into the mining sector. To attain metal productivity, mining companies need to think how they are going to build, recruit or borrow the right skills and capabilities across the organization, retain senior employees to minimize the negative impact of attrition, create a compelling employee value proposition, equip future leaders with the skills needed to manage teams in a digital age, creative strategies, benchmarking to work towards best practices as an industry etc.

5. Digital Innovations

While application of technology has become business as usual, there is need to explore more if mining companies are doing it right with the expertise they engage. The risk that is involved here is the management of data that will give value for maximum production. Any twist or diversion from the data set collected due to digital manipulation will affect production trends and this puts a risk in business. Data holds the key to increase productivity and minimizing costs and enables decision automation to minimize loss across the entire value chain. As digital becomes business as usual, the threat surface that can be attacked is increasing

exponentially. This is largely due to contributing factors such as Information Technology (IT) data analytics and optimization, Artificial Intelligence etc. It is through these that digital adaptations should have excellence in security issues/fundamentals to avoid mine data being compromised. Automation and increased maturity in the use of data is proving to have significant benefits to large mining operations, in terms of providing an uplift in productivity and hence reduction in production costs per tonne.

6. Rising Costs as mining becomes more complex

Cost reduction needs to be sustainable and a keen focus on productivity will help to manage the impact of rising costs.

Automation and increased maturity in the use of data is proving to have significant benefits to large mining operations, in terms of providing an uplift in productivity and hence reduction in production costs per tonne. The market conditions have facilitated the rise of alternative sources of finance, such as, royalties, bonds and agreements, pre-finance offtake and equity-linked instruments. In such a situation, companies are faced with limited choices i.e. either to accept the options on the table or risk project stagnation, loss of competitive positioning and, at worst, loss of ownership (take it or leave it). As a result, they are often accepting terms that may be expensive to arrange and maintain, and may dilute future earnings, present loss of control and damage future financing prospects. Some steps which companies can take to respond to this risk are:

- ✓ Focus on sustainable cost reduction programs
- ✓ Encourage innovation and partnerships to help with longer-term reduction of costs
- ✓ Review capital tied up in high levels of pre-stripping, advance development and stockpiles
- ✓ Consider the use of contract mining vs. sale or leaseback
- ✓ Create strategic joint ventures to optimize economies of scale
- ✓ Reduce costs from a support function — automation in the back office
- ✓ Divest non-core assets
- ✓ Review supplier and service contracts
- ✓ Outsource

7. Access to energy

Energy must be sustainable, cost-effective and uninterrupted. Rising energy prices in an environment of declining metal prices and the resultant margin squeeze gives a higher risk. While falling factor, oil prices have brought some relief to mining and metals companies. In the event of a slump in oil due to results of oversupply and the imbalance, it becomes even more critical as mining and metals companies expand operations to remote areas with under-developed energy infrastructure.

Increasing affluence of the local population in developing markets has also increased demand for residential energy and created competition for energy between the community and the miners. Besides, ensuring energy security in a sustainable, cost-effective and uninterrupted manner requires an integrated approach, right from the project conception and planning stage. Companies can explore a number of alternatives to ensure access to affordable energy.



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Development agreement for Kanyika niobium mining nearing completion

By Wahard Betha

Africa-focused resources group Globe Metals and Mining has expressed optimism on the completion of Development Agreement (DA) for Kanyika Niobium Project in southern part of Mzimba, saying there are chances that it will be finalised and executed this financial year as negotiations with the Malawi Government are at peak.

Globe Metals' interest in the Kanyika area focuses on minerals of niobium and tantalum.

Commenting in the 2020 Annual Report, Globe's Chairperson Alice Wong said that the negotiations between the mining firm and the Malawi Government has maintained momentum on the advancement of the Kanyika DA.

Wong said: "Notwithstanding the recent change in government in Malawi with the inauguration of H.E. President Chakwera in July, it appears that finalisation of the Kanyika DA with the Government of Malawi is nearing finalisation, and the Company is optimistic, based upon its dialogue with, and the responsiveness of key government officials, that the Development Agreement will be finalised and executed this financial year."

"Execution of the Kanyika Development Agreement is a pre-condition to the issue of a mining licence which Globe is reliably informed will immediately follow."

Wong also stressed that upon execution of the DA and the firm being granted mining licence, Globe will be in a



Global completed exploration at kanyika

position to move forward with project funding pegged at the range of US\$210M to US\$230M for total estimated capital costs, and off-take arrangements.

"The Company's Board and management is optimistic in realising project financing and development opportunities in the near term," Wong said.

Globally, mining industry together with the metal market has immensely been affected by the effects of novel coronavirus pandemic as it has lowered the demand for global steel.

However, in a positive comment from Globe Metals in line with Kanyika Niobium Project, the company also renders optimism on the recovery of the global steel demand referencing the latest reports from the World Steel Association suggesting the recovery in 2021 due to the expected faster recovery of China from the pandemic as compared to the rest of the world.

"As demand for higher quality steel rises as a proportion of total steel demand, and usage grows in the automobile and aerospace industries, particularly in China, India and Japan, the need for niobium is increasing at a faster rate than steel output," Wong said.

According to Wong, despite the pandemic, analysts are still predicting that demand for niobium will grow at a Compound Annual Growth Rate (CAGR) of around 6% during the period from 2020 to 2025.

She said major factors driving the market are the increased consumption of niobium in structural steel due to its characteristics of tensile strength and durability for use in bridges, buildings and other large constructions such as

hangars and stadiums and extensive utilisation of niobium-based alloys in energy-efficient buildings and infrastructure, and the manufacture of aircraft engines and automobiles.

Lightweight materials and designs have also become increasingly important in the manufacture of automobiles, where driving dynamics is a major factor.

She also said the emerging focus of governments across the world on minimising carbon emissions and enhancing fuel economy has increased the importance of lightweight materials in the production of automobiles.

"These combinations of growth and demand bode well for the price of niobium. As does the new emerging market of niobium in new technologies like wind turbines, medical imaging, particle accelerators, as well as an exciting development in the manufacture of high-performance and ultra-safe ultra-rapid rechargeable batteries for electrical vehicles," Wong said.

So far, Globe Metals has conducted a number of activities at Kanyika including exploration targeting niobium and tantalum, a definite feasibility study, environmental and social impact assessment and development of resettlement action plan.

Once the DA for the project is completed and finances are secured, Globe will start construction of the mine projected to take 18 months.

Kanyika is expected to produce high purity niobium pentoxide and tantalum pentoxide powders which will be used as additives to steel to enable steel mills to produce high margin products through enhanced flexibility, weight reduction and strength.



Samples were collected at Kanyika for testing

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MWEITI hails ATI Law operationalization

• Next MWEITI report to be out by December

By Wahard Betha

The Malawi Extractive Industry Transparency Initiative (MWEITI) has hailed Government's decision to operationalize the long awaited Access to Information (ATI) Law saying the development will spearhead speedy implementation of its agenda.

Coordinator for MWEITI Catherine Chilima told Mining & Trade Review in an exclusive interview that the ATI law will play a key role in facilitating the timely submission of important data on payments and revenue for compilation of EITI reports.

Chilima said following the operationalization, EITI reports will now be prepared on time in accordance with the International EITI Standards requirements for credible payments and revenue data.

She said: "The ATI Law will instill assurance of timely and quality data with all submissions validated by high level authorities of respective reporting institutions."

"The ATI Law will enhance timely provision of good quality data by the reporting institutions. With the law in place, MWEITI has not had incidences in which there were significant challenges accessing information on the main target areas."

Meanwhile, MWEITI is set to release the next MWEITI report by December 31, 2020.

Chilima explained that there have been delays to release the report this year attributed to the challenges resulting from the impact of the coronavirus (Covid-19) pandemic.

She said Malawi and other countries' decision to lockdown airports and borders delayed the process of recruiting an Independent Administrator for MWEITI.

Chilima also said the MWEITI Secretariat scaled down its activities in compliance with the Government measures for prevention of the spread of the virus.

She said: "In view of the challenges being faced



Launching ceremony for previous MWEITI report

worldwide, the International EITI Board agreed to relax the requirements for reporting to ensure that the EITI participating countries maintain the momentum of the EITI process."

"They provided guidelines for flexible report writing and extended the deadline for submission of the reports to December 31st, 2020."

"So far, the Independent Administrator submitted the inception report which was approved by the Multi-Sectoral Group Board."

The Multi-Sectoral Group Board is made up of Government, Civil Society Organizations and Natural Resources Companies.

In July 2016 MWEITI hired Moore Stephens, an Independent Administrator to help prepare the country's first report.

The report drew 13 recommendations which ranged from improving technical aspects to the EITI reporting process to reforms related to strengthening the impact of EITI implantation on natural resource governance.

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TECHNICAL FILE

by Dr. Grain Wyson Phillip Malunga FIMMM

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Raw coal for domestic use

Abstract

Malawi's over dependency on charcoal and firewood has heavily impacted the environment. Deforestation and forestry degradation has reached an alarming level. 54% of urban household cooking relies on charcoal. Conversion of wood to charcoal can reach 9 to 1. This needs to be checked. One of the solutions is promoting use of coal for domestic household use. Coal from Kasikizi Coal Mine in Karonga was experimented for this purpose.

Introduction

The National Charcoal Strategy (NCS) 2017 provides a framework to address the linked problems of increased deforestation and increased demand for household cooking fuel. Malawi Energy Policy, 2018, commits government to promote coal as a fuel for power generation and as an alternative to wood fuel for household use, tobacco curing and other applications. Government aims also to promote appropriate end-use technologies to facilitate use of coal in household and tobacco curing applications.

Malawi's household use of charcoal is about 88% and charcoal use dominates urban household cooking at 54% (National Charcoal Strategy, 2017). Household use of coal will go a long way in reducing deforestation arising from use of firewood and charcoal both in rural and urban areas. Malawi coal can be used in raw form or as coal briquette. Certain self-induced discipline is required to avoid health risks in using the coal.

Coal from Kasikizi Mine (Figure 1) in Karonga was tried for cooking using local and improved cooking stoves (Figure 3).

Energy Consumption Analysis in Malawi

More than 97% of households in Malawi rely on biomass through charcoal and firewood for domestic cooking and heating. This has resulted in high levels of deforestation and forest degradation affecting water availability, hydropower-generating capacity, and climate change. Electricity, for primary cooking, has a national penetration rate of 2.0% due to low household income and availability.

Current national electricity access rate is 11 percent with urban areas having 42% and rural areas having 4%. Our annual population growth rate of 2.8 percent is higher than electrification rate. Malawi has current installed generation capacity of 482 MW against an estimated demand of about 440 MW. Recent droughts have led to reduced river flow rates and low water levels in Lake Malawi affecting availability of hydropower. This has led to over reliance of charcoal for household urban use.

Coal

Coal is a black, solid, carbon-rich mineral, obtained underground and used for heating (Figure 1). Table 1 shows that Kasikizi coal is of good quality and falls within sub-bituminous to bituminous coal type.

Table 1: Kasikizi Coal Quality

Analysis %	Mkwinda, Mwankenja Basin		
	SAMPLE No.		
	1	2	3
Moisture	6.9	5.7	3.0
Fixed Carbon	53.3	50.3	50.0
Ash	3.8	20.7	20.1
Volatile Matter	36.0	23.3	26.8
Calorific Value (Cal/Kg)	7,009	5,828	6,124
Sulphur	-	0.4	0.31

Kasikizi coal is grey-black coal with shiny streaks of anthracite (Figure 2). The average ash content is 20% and less than 1% Sulphur. Its calorific value averages 5,800 Cal/Kg.

Coal Firing

An experiment was undertaken to use the coal in a domestic stove (Figure 1) just the same way as charcoal is used. Using a start-up coal to charcoal mixture of 3 to 1, it takes about 5 minutes to light the coal while using card board paper/ordinary paper and ordinary wood it takes about 15 to 20 minutes. In other words to light 1.0 Kg of coal one requires about 300 grams of charcoal. This is enough to cook up to 1.5 hours. Cooking using coal saves use of a lot of charcoal and by extension minimizes deforestation. It has been stated that to produce one tone of coal requires 9 tonnes of wood. One tonne of coal saves 27 tonnes of wood.

High ash content slows down combustion. It is recommended that direct use of mineral coal should be with the one that contains less than 20% ash content.

Phillips Fan Stove (Model HD4012) was used to burn Kasikizi coal in comparison with the traditional cook stove. This Philips stove has an inbuilt fan and a rechargeable battery that forces air into the top and bottom of the combustion chamber, leaving a smoke-free coal-fire within very little coal used.

Similar amount of coal and charcoal was used with the traditional stove. The Philips fan Stove performed better than the traditional stove because of its use of fan ventilation. There was more heat loss in the traditional stove than the fan stove. In terms of affordability, the traditional stove is far much cheaper and less energy efficient. It also emits more smoke and takes longer to replenish, about 1 hour. The fan stove takes about 5 minutes but requires replenishment every 25 minutes.

Coal Briquetting

Briquetting of coal requires a binder to be mixed with duff coal, a press to turn mixture into a briquette which is then dried on sun or oven so that it is strong enough to be used in a cooking stove. The duff or fine coal should be close to uniform in size or screened.

Several binders are used such as molasses, plastic clay, starch, and saw dust. Molasses and starch are of good quality but costly to obtain. Plastic clays can be used provided that they do not constitute more than 15% of the briquette. Up to 10% starch paste from hot water can be mixed with duff coal (coal dust), pressed and dried to around 80o C. Coal dust is also used in a mixture with dung to form cakes and dried in the sun. Some countries may not encourage starch use due to food security issues. Sometimes combustion materials such as wax and NaNO₃ are added to improve combustion

Health Issues

Domestic Use of coal should be guided by ventilation, stove design, fuel quality and stove maintenance and operation. It has potential to introduce carcinogenic emissions and toxic elements such as fluorine, arsenic, lead, selenium, and mercury, which affect environmental health. These toxic elements can cause arsenicosis, dental and skeletal fluorosis. Exposure to these elements can be reduced by processing the coal and developing cautious behaviour of avoiding inhalations and encouraging outdoor use.

It is important to note that indoor emissions from household combustion of coal are carcinogenic to humans and can cause liver cancer.

Conclusion and Recommendation

Malawi's household use of charcoal is about 88% with charcoal use dominating urban household use reaching 54%. This has increased deforestation and forest degradation affecting biodiversity and encouraging climate change. Agricultural productivity, food security and hydropower generation has been negatively affected due drought and siltation during rainy season.

As part of energy mix it is imperative to use good quality raw coal or briquettes for domestic use.



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CEPA aids in formalization of salt miners

By Bester Kayaye

A civil society group the Centre for Environmental Policy and Advocacy (CEPA) has launched the Sustainable Artisanal Mining Applied for Livelihoods Advancement (SAMALA) project which is set to increase access to reliable markets for Artisanal and Small-Scale Miners (ASMs) dealing in salt and gold mining.

The project which is being implemented with financial backing from Swedish Development Partners (IM Swedish) is 4-years long and is expected to end in December 2023, having commenced in January this year.

Project Coordinator for the programme Hillary Bandawe explained that the project is targeting salt miners in Chavilakale Village in T/A Ngabu in Chikwawa District and alluvial gold miners in Balaka and Neno along Lisungwi River.

Bandawe said; "The objective of the project is to ensure that ASMs including women and youth are engaged in sustainable and profitable mining operations but causes minimal adverse environmental and social impacts to livelihoods of men, women and youth for now and future generations."

"We have introduced the project to the target communities and district and national level stakeholders. Thus far, despite challenges caused by coronavirus disease (Covid-19), the project has completed a baseline study and organized ASMs in the target communities into 'clubs' which are on the course of being registered and licensed. The clubs have received preliminary training on sustainable mining and have been sensitised on environmental management."

He explained that there is a need for enhanced capacity of women and youth in responsible ASM operations through expounded knowledge on the ASM regulatory framework.

"It is under our outcomes to see that there are reliable markets for these ASMs hence we have engaged Malawi Investment and Trade Centre (MITC) to look into their production process, and investors' profitability, Malawi Bureau of Standards Certification then articulate on how we can secure reliable markets for them," Bandawe said.

Through the project, CEPA will train ASMs in responsible production, processing and marketing of mineral resources as well as enhance capacity of women and youth in responsible ASM operations among others; eradicating child labor, ensuring prudent natural resource management, and gender dynamics.



Bandawe for sustainable and profitable mining

SAMALA project is also looking into improving efficiency of salt and gold extraction equipment, supporting operationalisation of the ASM practical from an experience based perspective a transition which will also contribute to research, learning and policy development on the Malawi ASM subsector.

Bandawe said: "We are aware that the salt mining community is eager to advance their activities; prior to the project there was only one active salt miner and now there are 50 salt miners carrying out mining every day from 6am to 6pm in two shifts, capable of producing ten 50kg bags or more per month."

"In terms of markets, the project will ensure that their product is of a standard acceptable on local and international markets and will link the miners to reliable markets through interface meetings, trade fairs and more," he said.

In the extraction of salt, the saline brine is scooped on the surface of the soil and dissolved in water before filtration and evaporation through low heating or sun evaporation.

Commenting on the environmental aspect of the mining operations which use firewood, District Forestry Officer for Chikwawa District Hector Mkawihe explained that the forest office has planned to establish woodlots for the miners in which trees will be planted annually.

"We understand that the project that CEPA has embarked on is a sustainable one and given that these ASMs are given necessary knowledge and machinery to



Miner with finished product

advance their operations, it will go along way in transforming many livelihoods and our role as environmental experts is to ensure that these operations are in line with the Forestry Act," Mkawihe said.

He said the miners are using indigenous methods which are destroying the environment through deforestation, air pollution, and siltation of rivers hence there is need to introduce environmentally friendly solutions such as reforestation and development of low-cost sustainable technologies for mining and processing.

"Deforestation in Chikwawa district is at 1.8% per annum, this is really a worrisome state as it trickles down to the country as a whole hence there is a need for more efforts in decreasing these incidents," he said.

Meanwhile, the Forestry Office has issued 16-thousand seedlings to the club to establish a woodlot as they continue engaging with communities through sensitisation meetings to highlight on how to avoid endangering indigenous trees.

Trade Promotion Officer at Malawi Investment and Trade Centre (MITC) Erasto Maondo expressed satisfaction over the SAMALA project saying it has great potential to attract investors to be ordering salt from the miners.

"We are going to engage with other institutions such as Ministry of Trade and Malawi Bureau of Standards(MBS) to formalise the cooperative and certify the salt," he said.

Maondo explained that there is a great demand for salt even on local market as Malawi imports salt from Botswana and Mozambique.

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