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ABOUT PUBLICATION

Mining Zimbabwe is the premier source of Zimbabwe Mining News. Our core focus is the Zimbabwe Mining Industry, trends, new technologies being developed and used to improve this crucial sector, as well as new opportunities and investments arising from it. Mining Zimbabwe's sole purpose is growing and empowering the Mining Industry and highlighting all its challenges as well as putting forth expert solutions

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Ministry of Mines task team moves in to clear mining title backlogs

The Ministry of Mines and Mining Development is on a national tour clearing all application backlogs ensuring that miners mine formally, the Mines Minister Hon Winston Chitando has said.

Rudairo Mapuranga

According to the Minister, the second republic has attracted investors who have an appetite for investing in the mining sector as a result the provincial offices found themselves in a huge backlog due to the drastic increase in mining title applications.

The Minister said the country currently has a backlog of 15 thousand applications, and his Ministry has managed to issue over 20 thousand mining certificates so far.

"Every day we are moving towards the US\$12 Billion. At the beginning of this year, we had a backlog of 15 000 mining application, it means we have more miners investing in the industry. We also have seen over 20 000 new mining locations being issued."

"We will make sure that we exceed the US\$12 Billion industry ensuring that all these new mining locations contribute,"

Minister Chitando said.

Minister Chitando said the Ministry is going to make sure that before the end of the year the backlog in mining application is cleared as his leadership is geared to see the growth and development of the mining sector to a US\$12 Billion industry.

"We want to make sure that by the end of the year, the backlog is cleared," the Minister said.

Miners have been complaining over delays in the processing of mining licenses, with applications reportedly dating back to 2018.

The Ministry of Mines and Mining Development has been dragging its feet in issuing out mining licenses, with miners citing corruption and incapacitation at provincial mines offices throughout the country.

Clearing the backlog on mining licenses is a commendable move that enhances the attainment of the US\$12 Billion industry by 2023.

It is however not clear if Aim Listed Vast Resources which had been positively

projecting Zimbabwe as a good investment destination is on the outstanding 15 000 pending mining title applications list.

The government of Zimbabwe launched the USD12 Billion Economy by 2023 in October 2019 as part of the broader macroeconomic roadmap towards an Upper Middle-Income Economy by 2030.

The USD12 billion mining industry represented a 344% increase in mining revenue. According to the roadmap, the multi-billion-dollar industry will be driven by gold, platinum, diamond, chrome, iron ore, coal, lithium, and other minerals.

Through US\$12 billion roadmap, President Mnangagwa has set a target of US\$4 billion for gold producers while platinum and diamonds are expected to weigh in US\$3 billion and US\$1 billion, respectively. Chrome, Nickel, and Steel are expected to generate US\$1 billion, coal and hydrocarbons are also expected to produce US\$ 1 billion. Lithium is expected to produce US\$0.5 billion while other minerals are forecast to produce US\$1.5 billion.



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Stryker arms and ammunition is Zimbabwe's premium weapons dealership. Our main focus has always been on import and distribution to sub-dealers in and around Zimbabwe.

However, with the surge in violent and armed crime around the country, we have set up different offerings for different industries. As all our products and platforms are industry-specific, we provide tailored solutions specific to each of our client's needs and requirements. We pride ourselves on offering the highest quality of service to every client and tailored solutions to fit their budget, whilst maintaining the strictest confidentiality and guaranteed client satisfaction in all that we do.

Industries we serve:

- **Security Services**
- **Mining Industry**
- **Anti poaching & Conservation**
- **VIP protection services**
- **Banks & Bureaus**
- **Home defence**
- **Competition shooting**
- **Hunting**

Mining Industry

Zimbabwe has some of the greatest mineral

deposits in the world. Many mining ventures are often underfunded or poorly managed when it comes to the security procedures of the mine, thus we have found many mines are losing revenue through internal theft as well as external security threats. Often mines are located in remote areas with little or no access to adequate security services or police infrastructure. Mines tend to be prone to unwanted trespassing and often internal security is undertrained and does not have access to adequate resources.



With the surge in organised crime, we have found that security companies and internal security operating within the mining sector are ill-equipped and inadequately trained. The threats we are facing in today society has never been seen before in Zimbabwe at this level of intensity and armed gangs are reportedly at an all-time high.

Mining is not a one size fits all solution therefore we tailor security procedures and systems according to clients budgets. We provide all clients with a risk assessment and solutions to allow them to scale up security in stages in line with the growth of the mine.

The operation and security of a mine requires an often ever-evolving approach to maintain standards, adapt to changes, avoid predictability and keep pace with technological advancements. Numerous factors expose a mine to significant risks.

The remoteness of the mine's location

Limited local infrastructure and geopolitical instability increase the susceptibility to malicious attacks. These risks are magnified by the scale of an operation. Any security breach has the potential to endanger staff, damage the local environment and disrupt production.

While the provision of security involves carefully designed systems, processes and technology. It is primarily about people. An experienced well-trained security team can assist in the maintenance of a safety culture, thereby reducing shrinkage and expenditure due to theft by ensuring only authorised personnel can enter a site. Any successful security plan for a mining environment must incorporate a comprehensive site-security training program.

A training program must be tailored to the unique and specific threats and vulnerabilities faced by each location. A one-size-fits-all approach (as used by most security companies) may leave certain areas of a site or security system vulnerable to exploitation by staff, armed gangs and syndicates.

Through our broad-based products and service offering, we offer the following solutions to the risks and threats that mines face daily often leaving them vulnerable:

1. SITE INSPECTION (RISK ASSESSMENT REPORT)

The first step is to identify all risk factors of the respective location, to assess potential threats that May impact personnel Security and assets. After assessments are made and a RISK REPORT provided where recommendations are made to the following:

i. THE SITE

- ii. PHYSICAL INSTALLATIONS
- iii. OPERATIONAL SECURITY
- iv. STAFF
- v. SURROUNDING AREAS

2. TRAINING

The effective security of a site requires that security employees receive the required and adequate training to conduct their duties. As the demand for a security employee increases by the inclusion of weapons or transit of valuable goods, the training demand increases. The following are a series of courses to be conducted for security personnel:

- a. Rules And Regulations
- b. Security Procedures
- c. Patrol Techniques
- d. Timings And Handovers
- e. Use Of Canines
- f. Signing In And Out
- g. Access Control
- h. Weapons Handling
- i. First Aid
- j. Detaining Individuals
- k. Searches
- l. Scene Of Crime

3. WEAPONS TRAINING

The weapons training courses are tailor-made depending on what weapons platforms we provide the mine. As technology has increased we are at the forefront of providing the most up to date weapons systems for every specific threat or scenario likely to be experienced by a mine or related business. The following subjects (but not limited to) will be conducted on the weapons training course:

- a. WEAPON HANDLING
- b. WEAPON HANDLING TEST
- c. RANGE WORK
- d. CONTACT DRILLS
- e. BREAK CONTACT DRILLS
- f. VEHICLE CONTACT DRILLS
- g. FIRST AID
- h. DRIVING TECHNIQUES
- i. SCENARIO BASED EXERCISES

4. INDUSTRY-SPECIFIC PRODUCT SOLUTIONS

The following products are provided and work well within the mining industry to help security personnel thwart any attempt by armed gangs as well as petty criminals:

- a. Scalable Surveillance systems
- b. Anti-cut fencing solutions

- c. Area-specific access control
- d. Panic rooms
- e. Specialised weapon systems
- f. Lethal and non-lethal ammunition
- g. Ballistic security vests
- h. Ballistic vehicle products
- i. Thermal drones with geofencing technology

WEAPONS OPTIONS:

1. Semi automatic rifles

The semi-automatic rifle also known as a modern sporting rifle is often used when engaging in close threats as well as multiple threats. Unlike the traditional bolt action rifle which is predominantly used for hunting, the modern sporting rifle is more accurate than pistols and revolvers. Personnel have the ability to engage multiple threats without having to continuously load the rifle, unlike the bolt action rifle security companies currently use. The ability to change magazines quickly and engage threats at short to medium distances makes this weapon platform one of the most advanced and user-friendly systems on the market perfect for mines, cash in transit and bullion in transit teams because of its compact nature.

2. Shotguns

We provide various shotgun options for close threats where security personnel may need to engage a threat with non-lethal or lethal ammunition with a distance of up to 22-27m. Whilst shotguns have been the weapon of choice on most mining installations they have limitations with their roles as well as ammunition quantity. Most shotguns are limited to 7 rounds with a longer reloading time, exposing personnel to higher risk.

3. Pistols

We provide an array of pistols to every category of client from micro pistols which takes 6 rounds to full-size pistols which take up to 18 rounds. Depending on the client's specific needs we can provide a solution that will suit their requirements.

WHERE WE ARE

Stryker arms & ammunition operates out of Harare and our focus is on the discretion and privacy of ourselves and our clients. We work on an appointment basis and do not take any walk-in clients. Should you need any of our above-mentioned services or products, please get in touch with us on:

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Henrietta Rushwaya wins ZMF Presidency



Henrietta Rushwaya won the Zimbabwe Miners Federation (ZMF) Presidency.

Rushwaya ran unopposed and was resoundingly endorsed by all provinces to run for the next 5 years at the helm of Zimbabwe's largest mining body. Rushwaya was announced as President by the returning officer and CEO of ZMF Wellington Takavarasha. In attendance were the ZMF patron and Mines and Mining Development Minister Winston Chitando, his deputy Hon Polite Kambamira and Minister of State for Mashwest province Mary Mliswa, and the new ZMF Executives and leadership from across the country. In her acceptance speech, Rushwaya said she was humbled by the trust and confidence placed in her by the miners. She said she wants to rebuild the backbone of the nation and make sure that the ASM sector is aligned in the mainstream economy.

Calls for government to declare 6th June a national holiday

Zimbabwe Advanced Mine Workers Union (ZIAMU) has called on the government to honour mineworkers who lost their lives at the Kamandama mine disaster by declaring the day when the miners succumbed a public holiday.

The mineworkers union said it was important for the day to be recognized nationally in an effort to intensify safety awareness in the country's extractive industry. "ZIAMU believes that it would be appropriate for the 6th of June to be declared a public holiday, to heighten safety consciousness in the country," the union said. The Kamandama disaster remains the worst mine disaster in the country's history and every June 6, commemorations are held to honour the 427 miners who perished in 1972 at the Colliery's Kamandama Mine Disaster. A Golf Tournament is held before the commemorations to raise funds towards the cause, but this year it was not held due to Covid-19.

Invictus on a recruitment drive to employ 100 locals

INVICTUS Energy, which is developing the Cabora Bassa oil and gas project in Muzarabani, has embarked on a recruitment drive targeting to employ 100 locals ahead of the firm's seismic acquisition campaign. The seismic acquisition is a process of gathering subsurface vibrations during oil and gas development and used to determine location with higher chances of success for discovery of minerals.

"The company has commenced assisting Polaris with the recruitment of up to 100 local employees who will be involved in the seismic campaign, the vast majority of which are expected to come from within the local communities." The camp construction will commence prior to the end of June and is expected to be completed in early July," said Invictus.

Chibafa appointed CoMZ President

Amplats' Shurugwi based Unki Mine Chief Financial Officer Mr Collin Chibafa has been appointed Chamber of Mines Zimbabwe president taking over from Mimosa head of corporate affairs Elizabeth Nerwande. Chibafa was appointed to lead the mining body at the chamber's annual conference in Victoria Falls, Thomas Gono from Golden Reef Mining is the first vice president while the second vice President is John Musekiwa from Zimasco.

Chinese still operating in Hwange despite ban

Chinese owned mining firms are still mining in Hwange National Park despite claims by the government that it has banned mining in national parks, Bulawayo Central Legislator has said.

Gvt gazettes new mining fees through SI185 of 2021

The government announced the new mining fees through Statutory Instrument 185 of 2021 Mining (General) (Amendment) Regulations, 2021 (No. 26) released on the 25th of June 2021. The new mining fees were welcomed by Zimbabwe's largest mining body the Zimbabwe Miners Federation (ZMF) whose President Ms Henrietta Rushwaya indicated the new prices were in tandem with the current economic situation in the country. "We applaud government efforts in ensuring that our requests get utmost attention especially the request we made previously with regards to the increase on mining fees which had been implemented and gazetted earlier during the year. ZMF the fees that have been gazetted as of today are quite in tandem with the current economic situation in the country and we are pleased to be the ones who are now welcoming the gazetted fees as an entity and as small-scale miners representative body we say thank you to government,".

Industry forecasts better Q2 prospects

Industry expects capacity utilisation to improve to 56 percent in the second quarter of the year, from 47 percent in the first quarter, but still lower than the previous year-end projection.

"Industry expects capacity utilisation to improve to 56 percent in the second quarter on the back of continued macroeconomic stability, low inflation, stable exchange rate and availability of agro raw materials from the good agriculture season."

RioZim claims US\$202m in spat with Falcon

Gold mining giant RioZim has filed a lawsuit at the High Court seeking to recover over US\$202 million from Falcon Resources for chrome ore it alleges was stolen during its long drawn out dispute with the latter. RioZim also demanding US\$209 640,87 being the cost of rehabilitating the mining site mined illegally by Falcon and Rusununguko Nkululeko Pvt Ltd. "The market value of chrome (47 percent to 55 percent) as at the date of the delict was US\$1,345 per pound or US\$2, 965 per tonne of the contained chromium hence the value of 707 tonnes of chrome ore as at the 6th of June 2018 is US\$2,096, 408, 72 the defendants are liable to pay the plaintiff this full sum," reads the summons.

Afrochine seeks State protection

Chinese mining firm, Afrochine Smelting, is appealing for State protection amid mounting resistance by some safari operators and residents objecting the granting of a special grant to the company in Hwange District in Matabeleland North province. Afrochine said the ongoing war against companies operating in the mining and energy sectors in Hwange was driven by "selfish individuals and groupings whose operations have become a well-oiled machine to thwart development in the area and derail the legitimate national economic activities."

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Exploration key as Freda Rebecca life nears end - Mtetwa



Exploration remains the only viable solution to replace big deposits like Freda Rebecca whose life span remains approximately five years, the Geological Society of Zimbabwe (GZS) Deputy Chairperson Kennedy Mtetwa has said.

Rudairo Mapuranga

According to Mtetwa, the government should have issued Exclusive Prospecting Orders (EPOs) when they were applied over a decade ago to ensure discoveries of other deposits sustaining the growth and development of the Mining industry.

Mtetwa said the government should speed up the way they do business to see the mining sector achieving the projected US\$12 Billion annually by 2023 and the gold industry achieving the projected US\$4 Billion annual revenue by the year 2023.

"As Freda Rebecca life heads for an end, exploration is required to replace this big deposit. The government should have issued EPOs when they were applied for a decade ago. Things must be done timeously. Some EPOs applied for 3 years ago still have not been granted,"

According to Zimbabwe's biggest Mining company, Kuvimba Mining House chief operating officer, Mr. Cobus Bronn there is a need for Freda Rebecca to undertake serious exploration to discover and build

the next mega-mine to replace Freda Rebecca.

"KMH recognises and understands the importance of providing the required sustaining capital to the mine to ensure sustainable and improved production at the lowest possible operating costs. Freda Rebecca Gold Mine has a remaining life of mine of approximately five years and the company is actively looking to augment the current life of mine by evaluating near resources and secondly undertaking an extensive exploration plan to find and build the next mega-mine to replace Freda Rebecca Mine." Cobus Bronn said.

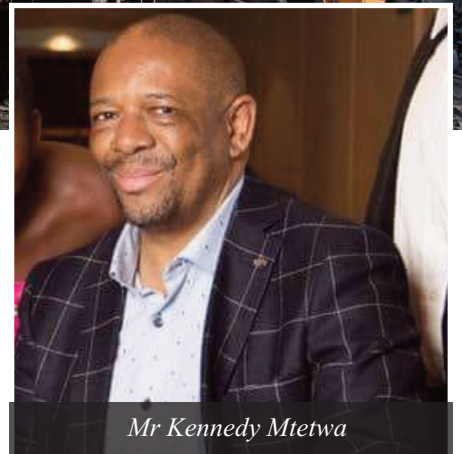


The government should have issued EPOs when they were applied for a decade ago. Things must be done timeously. Some EPOs applied for 3 years ago still have not been granted," Mtetwa



As Mining Zimbabwe we believe that the issuance of EPOs for the country to discover world-class deposits is of paramount importance for the mining industry to achieve the President's projected US\$12 billion mining annual revenue by 2023.

The mining sector truly has the potential to transform the economy which is expected to become an upper-middle-income earner by 2030, however, its over reliance



Mr Kennedy Mtetwa

on small-scale and artisanal mining will mean the vision like previously proposed blueprints may die a laughable death.

According to the US\$12 billion roadmap, gold producers are expected to reach a target of US\$4 billion while platinum and diamonds will weigh in US\$3 billion and US\$1 billion, respectively. Chrome, Nickel, and Steel are expected to generate US\$1 billion, coal and hydrocarbons are also expected to produce US\$1 billion. Lithium at the moment is expected to produce US\$0.5 billion while other minerals are forecast to produce US\$1.5 billion.

Without shooting down on their involvement in the resuscitation of the economy of Zimbabwe, small scale and artisanal miners cannot sustain mechanized mining of world-class operations. The country's over-reliance on micro miners becomes a headache towards the achievement of the US\$12 billion mining industry.


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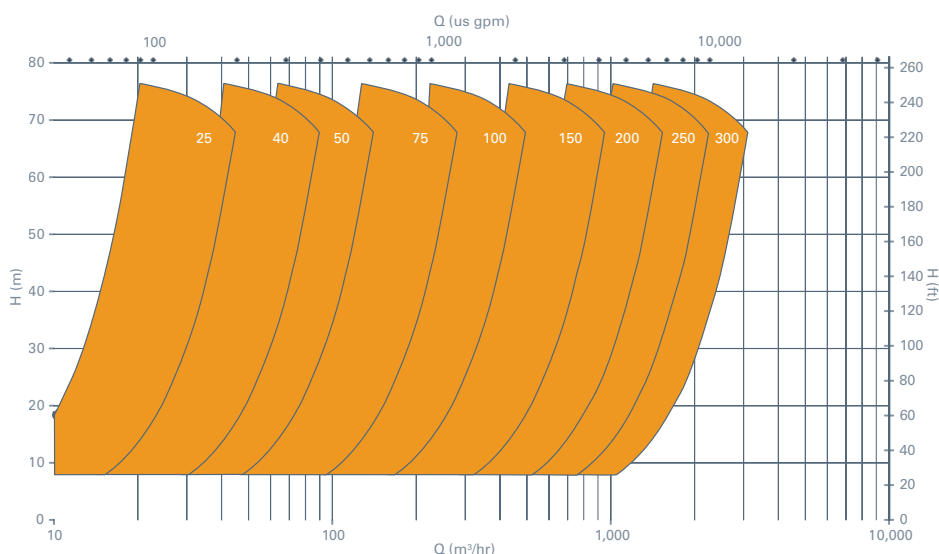
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Lithium edges closer to achieving 2023 target as Arcadia lithium commences production



The mining industry has moved closer to achieving the President's Vision for the industry becoming a US\$12 Billion annual earner by 2023 through the commencement and official production of the country's second lithium producing mine, the Arcadia lithium mine.

Rudairo Mapuranga

Speaking at the commissioning of the Arcadia lithium plant and handover of the first production to the company's offtake, Sinomine, The Minister of Mines and Mining Development Hon Winston Chitando said the coming in of the Arcadia lithium mine was a true reflection that the country was making inroads towards the 12billion industry day by day.

Through the president's mining roadmap, lithium is expected to earn US\$0.5 Billion annually by 2023. Zimbabwe is the world's fifth-largest lithium producer with only one mine, Bikita Minerals operating.

"The milestone is being achieved day by day," Minister Winston Chitando said.

It is quite clear that Lithium has attracted world recognition as a significant mineral playing a substantial role in electric cars and other clean tech gadgets and its popularity will earn the country significant dollars in the world market.

The commission of the Arcadia lithium pilot plant according to the Minister of State in the president's office for Mashonaland East province Senator

Apolonia Munzverengwi was a step towards the attainment of the US\$12 BILLION mining industry.

"The lithium pilot project is a step in the right direction towards the attainment of the US\$12 Billion mining sector," Senator Munzverengwi said.

The mining sector is already Zimbabwe's biggest foreign currency earner. Experts and the government are of the view that the sector is the leading horse towards the revival of the economy.

Through the President's US\$12 billion roadmap, a target of US\$4 billion was set for gold producers while platinum and diamonds will weigh in US\$3 billion and US\$1 billion, respectively. Chrome, Nickel, and Steel are expected to generate US\$1 billion, coal and hydrocarbons are also expected to produce US\$1 billion.

For the government to achieve the President's vision of turning the mining industry to fetch US\$12 billion annually by 2023, exploration and reopening of closed mines was at the epicentre of increasing the country's mineral production according to the Deputy Minister of Mines and Mining Development Hon Polite Kambamura.

The youthful Deputy Minister said the government was planning on reopening at the same time engage in serious exploration on the Zimbabwe Mining Development Company (ZMDC)'s mining projects.

Speaking at the same event Prospect Resources Executive Director Mr Paul Chimbodza said the company was now confident that it has the capacity to produce what the lithium market wants making it possible for the mine to build a bigger commercial plant in the next two years.

"This pilot plant you can consider it like a proof concept where we are now very confident that we can produce the quality product that the market wants. It also gives confidence to our funding efforts and we hope to reach financial closure very soon that allows us to build a bigger commercial plant, so in the next two years we should be building a plant that is 40 times bigger than this," Chimbodza said.

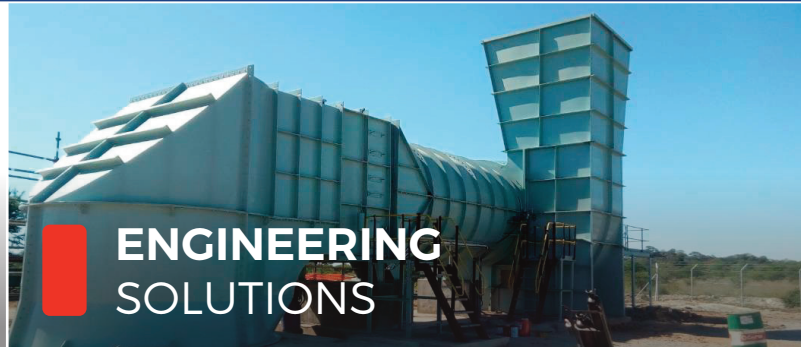
The Arcadia mine is in a unique global competitive advantage in that it is one of the few global producers of technical grade, ultra-low iron petalite (0.05% Fe2O3) and when in full commercial production the company will be one of the largest producers of such in-spec product.

The event was graced by mining industry heavyweights including Mines and Mining Development Portfolio Committee chairman Edmond Mkaratigwa, Chamber of Mines CEO Mr Isaac Kwesu, ZMF President Henrietta Rushwaya and CEO Mr Wellington Takavarasha, Mines Ministry Deputy Minister Polite Kambamura among others.





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We understand that each and every Organisational set up is unique and with this in mind, we offer tailor-made engineering solutions to our customers. We believe that Boltgas can add value to your operations.

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- **Contracting work**, with capacity to carryout projects from designing fabrications, installations, maintenance commission and decommission plants
- **Ground Support Systems** - Represent Minova Global
- **Manufacturing Capabilities** - Currently manufacturing Cocopan, Granby Cars, Conveyor rollers, pulleys and complete conveyor structures. We also have a foundry in the group which cast all crusher bronze parts and currently being upgraded to do high chrome pump wear parts.
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Fidelity unbundling

What we know so far

THE Reserve Bank of Zimbabwe (RBZ) says so far 10 mining companies, including small-scale producers, have expressed interest in snapping a 60% shareholding in Fidelity Printers and Refiners (Private) Limited (FPR).

By Dumisani Nyoni

The central bank in December last year announced plans to cede control of the refinery of gold, offering mining companies 60% of the refining business of FPR.

RBZ is splitting FPR into two entities, keeping the coin minting and security printing arm, but keeping 40% of the gold refinery side while miners gain control.

The unbundling of FPR, according to the statement, is designed to partially privatise the gold refining business by allowing private players to acquire a stake therein and in the process secure and endear the private sector's interests in the production and marketing of gold in Zimbabwe.

By being part of the decision-making process on gold trading, it is expected that the gold producers' compliance levels in the trading of gold will significantly increase.

Using a three-year average delivery of gold to FPR, the Bank will offer 50% shareholding in FPR to the large scale gold producers, 3% to major FPR gold buying agents and a balance of 7% to the small scale producers through their representative bodies.

In an interview with Mining Zimbabwe, RBZ governor John Mangudya said the process was progressing smoothly.

"We are progressing very well and I think we are going to finalise (the issue) this

month. We have received a favourable response. So far around 10 of them, including large scale producers and small scale miners, have shown interest," he said.



Governor John Mangudya

Pressed to name the companies that have shown interest as well as revealing the new shareholding structure, Mangudya declined, citing a non-disclosure agreement that they signed.

The privatisation of FPR came after lobbying from some players in the mining business.

It follows the model of South Africa's biggest refinery, Rand Refinery, which is owned by the five largest gold miners AngloGold Ashanti, Gold Fields, Harmony, Sibanye Gold and DRD GOLD.

Among Zimbabwe's biggest gold producers are RioZim and Caledonia Mining.

Up to 500 000 people are estimated to work in small-scale mining operations in Zimbabwe, accounting for more than 60% of the country's gold output.

Benefits of unbundling FPR

The unbundling of FPR, according to mining experts, will make the country's sole gold buyer conduct its business profitably.

Also, it creates a laissez-faire system where there is minimal government intervention, thereby allowing FPR to conduct its business operations in a free market.

"Also, now they are able to benchmark their gold prices competitively in line with prevailing market conditions. There will be faster decision-making processes in line with dynamic Gold prices," Engineer Clever Sithole – Head Gemologist, (DAI-USAID Invest/ Afghanistan) recently told this publication. Sithole said it allows FPR to attract investors and wealthy shareholders if it decides to list on the stock market.

He said artisanal and small-scale miners (ASMs) stand to benefit as a result of attractive prices.



Eng Clever Sithole

"FPR liberalisation will also allow the entity to find ways of capacitating gold production such as attracting investments in machinery," he said.

Mines and Mining Development Portfolio Committee Chairperson Hon Edmond Mkaratigwa said the move creates a sense of process ownership among the gold sector stakeholders, effectively complementing the government's efforts on the promotion of business investment in the country.

"The approach theoretically further taps into existing opportunities that are not being fully utilised hence empowering locals. The question that may arise is whether the idea will be fully implemented and equitably," he said.

"Safeguards will also need to be put in place to guarantee the security of government interests against the nature of capital which is always to thrive towards acquiring and controlling more stake through which the government can become the victim of its future founders if they are irresponsibly avarice," Hon Mkaratigwa said.

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A portrait of Coburn Katanda, a middle-aged Black man with short hair, wearing a light blue button-down shirt. He is looking directly at the camera with a slight smile. The background is a plain, light-colored wall.

INTERVIEW: COBURN KATANDA

A Mine is a complex business to run as it requires careful planning and flawless management to function smoothly. This month Mining Zimbabwe interviewed the President of the Association of Mine Managers in Zimbabwe Mr Corburn Katanda who shared some insightful information on his line of work and mining in Zimbabwe in general.

What are the duties of a Mine Manager?

The Mine Manager is responsible for the overall performance of a mining company. Generically, duties include occupational health and safety management, monitoring and evaluation of production targets, budgeting and cost optimisation, human resources and industrial relations management, asset management, stakeholder and environmental management and project management.

How did you climb up the ladder to become a Mine Manager?

Every Mining Engineer goes through a formal, structured graduate development programme. This is tailor-made to produce a product that is eventually able to run a mine at any senior management level. My professional journey is no different, having started the graduate development programme at Zimbabwe Alloys Limited. Subsequent to the above, I then worked in various supervisory and managerial roles in several Zimbabwean Companies until I reached the level of Mine Manager.

Due to Covid-19, 2020 was a bad year for many companies, production was relatively very low. What are you doing to ensure that production this year improves?

The COVID-19 pandemic caught everyone unaware across the globe, the Zimbabwean Mining industry included. Adjustments to normal routines had to be made so that lives could be protected and production could be restored under the new normal. During the adjustment and acclimatisation period, mines were not operating at full capacity in most instances.

However, the mining industry has implemented the COVID-19 containment measures with the robustness and proficiency of the highest order. Consequently, COVID-19 cases within the industry have declined significantly since the start of the pandemic and new cases are being managed proactively and effectively.

In addition, the mining industry has embarked on a voluntary but widespread vaccination drive in an effort to support the government's thrust to achieve vaccination-induced herd immunity in the Country. So the combination of strict preventative and containment measures and the vaccination drive has allowed for some level of normalcy to be achieved. This has allowed mines to operate at normal or near-normal capacity. Thus we expect 2021 to be better compared to the prior year in terms of production.

As the President of the Association of Mine Managers in Zimbabwe. What are you planning as mine managers to ensure production improves to contribute to the 12 Billion mining industry by 2023?

As Mine Managers, our major responsibility is to manage mines so that they perform as designed with respect to all operational and strategic aspects. To that end, we routinely equip our members through on-the-job training and development, exchange of proven practices through structured technical visits or technical papers amongst other initiatives.

In 2021, the AMMZ Council has made membership growth one of its key priority areas. This is meant to ensure that the impacts of AMMZ actions and initiatives are far-reaching and industry-wide.

The AMMZ Council is also working with the Ministry of Mines and Mining Development and other stakeholders to review and update the Mining Regulations to ensure that they are current and take into consideration the technological advancements that have been realised within the mining industry since the early 90s. Once completed, the new set of regulations will undoubtedly create an enabling environment for the efficient operations of mines. If mines operation efficiently and at full capacity, then the USD12Bn mining industry will be realized by 2023.

Furthermore, the AMMZ proactively works with all higher and tertiary learning institutions offering Mining or Mining related programmes to develop the curriculum, offer work-related training and provide coaching and guidance to students. This is meant to ensure that these institutions produce a product that can make an impact within the industry and enhance the resource pool available to the Mine Manager in their quest to have operations run effectively, efficiently and safely.

What do you consider to be three major challenges for the mining industry?

The three major challenges in the mining industry are

1. Low foreign currency retention thresholds impacting adversely on procurement of imported capital equipment and other inputs
2. Poor infrastructure leading to inadequate support to mining projects (electricity, roads, water, rail)
3. An uncompetitive and highly volatile fiscal landscape

Mining professionals especially from the large scale see ASM as a waste of time. But looking at forex generated and contribution to the fiscus ASM is leading. Won't it be helpful to national interest for experts like yourself to engage ASM and help them conduct better, proper mining rather than just say NDEZVEKUPENGA IZVI (its just madness) ?

The Large Scale Mines have always supported Artisanal Miners within their spheres of influence. This has seen mines sending out rescue teams and equipment to assist with rescue missions in the unfortunate event of accidents amongst other support initiatives. The SHE Committee of the Chamber of Mines has always invited small scale miners to their meetings so that they can benefit and contribute towards the promotion of safety at mines.

Following recent major accidents on artisanal mining operations across the Country, AMMZ will be actively working with the Mines Inspectorate on health and safety awareness campaigns targeted at Artisanal Miners.

We have also seen some Artisanal Miners formally engage mining professionals on a full-time or part-time basis to assist them with the technical aspects of their operations. We encourage that more of this be done to ensure that these operations are run sustainably and continue to contribute to the GDP of the country in the long run, without loss of life or environmental degradation.

Word of advice to small-scale miners?

The successful operation of any mine requires experts who understand the health & safety, environmental, technical and financial aspects inherent to mining. Small scale miners should therefore be mindful of the need to recruit technical and financial experts to help them run the mines safely, sustainably and efficiently.

Zimbabwe does little value addition, in essence, we are exporting raw materials, as well as jobs and vast opportunities, is there anything being done to have people for example buy local jewellery?

Moving up the mineral value chain is mostly an economic decision that factors the operating environment and economies of scale.

Zimbabwe has done well in this regard and still can do more. We have a gold refinery at Fidelity Printers and Refiners, the nickel industry had progressed to have Empress Nickel Refinery and Bindura Smelter and Refinery, in PGMs Unki Mining Complex now operates a smelter so does ZIMPLATS. We also had Alaska Copper Smelter back in the day. These developments occurred because the economic situation in the country allowed for such investment and the critical mass of feed for these processes was achieved.

The private sector and government can work together to create the necessary environment that promotes the progression of processes up the value chain.

As a young person, what is your take on using technology in mines

Technology is what drives the world we live in today, mines included. Today is about working smart and effectively, and technology presents a range of possibilities. Personally and professionally I am alive to this development. As the AMMZ President, I am at the heart of the project to review and update our mining regulations to ensure that they allow for effective use of the readily available and applicable technology.

If you are asked by the President of the Republic about five things that should be done immediately to change investor interest what would you advise him?

As was discussed earlier, there is a need to deal with the challenges facing the mining industry. In addition to this, there is a need to develop a raft of incentives that will attract large capital into the mining industry.

It will be important to expedite the amendments to the Mines and Minerals Act to provide a competitive legal framework for mining. This includes establishing a computerised mining cadastre system for the enhancement of the security of mining titles.

Most LSM mines don't even have simple

basics like websites social media platforms etc or have seriously outdated websites, save for the likes of Caledonia, ZCDC, Premier African Minerals among others. We get to hear about them when something goes wrong and they are firefighting. What advice can you give to fellow managers on the communication front?

The mining organisations that you mention are publicly listed companies that are obliged by the disclosure rules on the stock exchanges they are listed on. We encourage mines to engage their communities in order to strengthen the social license to operate. These engagements will facilitate the provision of information on matters that impact and is of concern to the affected community.

Mining projects impact the local population through employment creation, export earnings, consumption of goods and services produced in the country, Corporate Social Investments among many impacts. The contribution of the mining industry to agriculture for example is immense. The contribution of means to road construction, electricity supply, water supply among other infrastructure projects has been significant and new projects will add to the stock of benefits so far realised.

I have visited many mines locally and the dilapidation of roads that lead to most of the mines is unbelievable. Are mines are taking their CSR seriously?

The responsibility for infrastructure development and maintenance lays with the central government or local authorities. Mines pay land development levies to local authorities, these should ideally be used to maintain the road infrastructure amongst other things. However, many mines over and above these payments do support local authorities by maintaining roads, repair of road maintenance equipment, provision of fuel among other forms of support.

We recently saw a crane with a +27 telephone number working at a mine in Gwanda yet there are local crane companies available locally for example. Are LSM (Large scale miners) supporting the local businesses by buying equipment, products and services locally?

No comments

What should be done for large scale to reclaim their position as the highest forex earners in the country?

The mining industry remains the largest foreign currency earning contributing over 60% to total foreign currency earning per year. The drive is to grow the industry further, in line with the strategic objectives set by the Ministry of Mines and Mining Development, ensuring that sustainability issues are addressed so that we do not produce at the expense of future generations or risk future production dips.

There are reports of Corruption allegations in LSM whereby procurement departments only give work to people who give their buyers something (over-invoicing in some instances) have you ever come across such information?

We are not aware of these allegations. Anyone with proof is encouraged to report these cases to the police and other institutions responsible for preventing such crimes.

Any tips to a Chenai or Nhlanhla who is studying to be a Mine Manager like yourself?

The mining industry has many opportunities. It takes patience and dedication to reach the level of a Mine Manager. One should be prepared to learn and grow based on available opportunities. The goal should not be to become a Mine Manager but to be a Mining professional who excels in their area of expertise, specialisation or responsibility. The mining industry opportunities are vast and much more than just a Mine Manager role. So these students should be focused on being a mining professional that makes a difference wherever they go.

Beside Managing what do you do in your spare time and family?

I like spending most of my time at home, with my family, watching TV, reading or playing golf. Developing myself professionally and academically is always at the centre of what I do during the weekends and spare time.

Any parting words?

The mining industry as a whole must be collaborative. Companies must look outside their organizations and build an ecosystem that's based on the best possible practices that allow miners to maximise their full potential. It's about taking responsibility and making conscious decisions that enable the industry to move forward as a whole

Artisanal and Small-scale Mining (ASM) Formalisation Benefits

The majority of artisanal and small-scale mining activities operate informally, which means they take place illegally without the required licences and permits. Despite the existence of legal frameworks for ASM in many countries around the world, the majority of operations remain unregulated and untaxed.

Often, informal activities will have a 'social licence to operate'. This may come from the local community, other local actors, or miners owning the surface rights or the land above ground. This is despite the state being the sole owner of sub-surface mineral rights and the only actor able to award concessions and official mining licences.

The process of formalisation therefore not only concerns the development and existence of legal, regulatory and policy frameworks for ASM, but also the extent to which these are successfully activated, implemented, and enforced, and whether they are appropriate and sufficiently in tune with local contexts and communities. Formalisation offers advantages not only to artisanal and small-scale miners but also to governments, large-scale mining companies, and rural communities.

Formalisation:

- Helps promote better working practices and conditions.
- Reduces negative environmental impacts of activities.
- Prevents and helps to better manage conflict associated with encroachment of miners and operations onto large-scale mining concessions.
- Supports ASM to become an engine of enterprise and growth leading to higher government returns and job creation and stability.
- Enables government to capture the revenues and tax from ASM activities.
- Is an essential first step to transforming ASM into a sustainable livelihood activity.
- Reduces criminality and criminal elements associated with some ASM activities.

Formalisation, however, is not an easy task and there is no single policy response or solution. There needs to be a concerted, collaborative effort as well as the will to formalise from all stakeholders involved. This includes international development agencies, governments, NGOs, academic experts, the private sector, local ASM communities, and crucially, miners themselves.

A number of issues and improvements are often cited as key parts of the ASM formalisation process:

1. Streamlined licensing

Despite many countries now having legal frameworks for ASM that allow for the purchase of a licence, the majority of mining operations and miners work informally and illegally without a licence and/or any additional required permits.

In some cases, obtaining a licence can be a long and bureaucratic process that may also be open to corruption and bribery. These issues may either entirely prevent and/or discourage people engaged in ASM from purchasing a licence. Streamlining the licensing process by making it easier to complete, reducing the time, fees and costs associated with obtaining one, decentralising the process, developing easily accessible online platforms, and ensuring regulations and categories are in line with local contexts can help significantly with formalisation.

2. Access to land and geological prospecting

A commonly cited issue is either the lack of access to or availability of land that is also of significant ore grades to make the mineral deposit viable for ASM. Conducting geological prospecting and identifying and demarcating land and zones specifically for ASM activities would help address this issue. Encouraging large-scale mining companies and concessionaires to shed off areas of land that are either not being mined or are deemed uneconomical to mine on a large scale would also help free up areas for ASM activities.

3. Technical and vocational education and training

Developing accessible technical and vocational education and training (TVET) courses and materials for miners that include information on safe working practices and more efficient and effective mining techniques in order to reduce the negative social and environmental impacts of operations and improve working conditions, efficiency, yields and incomes.

4. Support and equipment leasing facilities, and processing centres for ASM

Develop support facilities for miners to attend in order to receive information, lease or purchase good quality equipment,

and process ores. It is important that the needs of miners and the community are properly assessed first to ensure support facilities meet their requirements and local contexts.

5. Improve the capacity, strength, and collaboration of institutions and government

Strengthening government departments and institutions, and encouraging collaboration of different ministries and departments at both the national and local level in order to develop more effective, joined-up approaches and remove overlapping functions.

6. Better monitoring, enforcement, and education on laws and regulations

Increase capacity of government agencies to better monitor ASM activities and more effectively and consistently enforce fines and penalties where applicable. Better educate miners on the laws and regulations that exist and build good working relationships between enforcement agencies, miners, and ASM communities.

7. Formulating policies, regulations, and laws specifically for the ASM sector

Ensuring that existing laws and regulations are appropriate and sufficiently in tune with ASM activities and local contexts. When no or few regulations exist, or ASM is covered under regulations and laws designed for large-scale mining activities, there is a need to develop new laws, policies, and regulations solely for ASM.

8. Improve the coordination and involvement of ASM associations and co-operatives

Improving the development, coordination, and strength of ASM associations and increasing their involvement in decision making is key to ensuring the development of effective policy and programmes. Having legitimate and well-organised national and international level ASM associations is beneficial to miners as well as policymakers and government. Associations provide a single entity with which to engage and consult on matters, a forum for the exchange of knowledge and ideas, and a grievance and dialogue mechanism for all sides.

Cooperatives also offer these benefits as well as enabling miners to pool their resources. In some countries being a member of a cooperative is a legal requirement to purchase an ASM licence.



The US\$12 Billion mining Industry: THE JOURNEY SO FAR

The Minister of Mines and Mining Development Hon Winston Chitando last month said Zimbabwe was on daily basis progressing towards achieving the President's vision for the mining industry becoming a US\$12 Billion annual earner by 2023.

Rudairo Mapuranga

The Minister said the growth and development in exploration and the opening of closed mines was an indication that good times were ahead in the achievement of the US\$12 Billion industry.

Through US\$12 billion roadmaps the President Emmerson Mnangagwa has set a target of US\$4 billion for gold producers while platinum and diamonds will weigh in US\$3 billion and US\$1 billion, respectively. Chrome, Nickel, and Steel are



expected to generate US\$1 billion, coal and hydrocarbons are also expected to produce US\$ 1 billion. Lithium is expected to produce US\$0.5 billion and other minerals are forecast to make US\$1.5 billion.

The Deputy Minister of Mines and Mining Development Hon Polite Kambamira said the Zimbabwe Mining Development Company (ZMDC) and Kuvimba Mining House are prioritizing exploration as well as reopening closed mines to increase the country's mineral production in line with the US\$12 Billion roadmap.

This is where the country is on the journey towards the 12billion mining industry.

US\$3 Billion platinum target

The growth and development of the Platinum subsector driven by new projects that are expected to take off at the end of this year and the beginning of 2022 have been encouraging leading Minister Chitando to be optimistic that its revenue can exceed US\$3bn by the end of next year.

"We are expecting platinum to exceed US\$3 billion revenue by the end of 2022 driven by new projects that are expected to start production by the end of this year

and the beginning of next year," Chitando said.

Platinum Group of Metals revenues have been hovering between US\$1.5 billion and US\$2 billion a year with the addition of the new projects the sector indeed is poised to significantly grow.

Some of the projects in the pipeline include Great Dyke Investment's Darwendale Platinum project, Bravura platinum and some expansion projects at Mimosa Mining Company and Unki Platinum Mines.

Zimbabwe's platinum producers are also planning to engage a consultant to advise on the establishment of a base metal refinery by 2025 and a precious metal refinery by 2027 to process platinum from all the country's platinum mines.

The platinum miners namely Zimplats, Mimosa Mining Company and Unki plan to jointly develop a base-metal refinery in the country. The plan has been under consideration since 2014.

The country has the second-largest known deposits of platinum after South Africa and has been pushing mining firms operating in the country to build refineries to stop the export of raw platinum ore.

Continued on next page>



US\$4 Billion Gold

Although gold deliveries to the country's sole gold buyer and exporter Fidelity Printers and Refiners (FPR) fell by 17 per cent to 1.668 tonnes in May 2021 from 2.015 tonnes achieved in May the previous year due to mainly unfavourable policies and smuggling. There is great hope for the gold sector to fetch the projected US\$4 Billion by 2023.

In April this year, gold deliveries declined 5 per cent to 1.38 tonnes from 1.46 tonnes recorded in the same period in 2020. The only positive output was recorded in March this year, during which deliveries improved 2% to 1.80 tonnes from 1.77 tonnes.

In an effort to improve gold deliveries, the Reserve Bank of Zimbabwe (RBZ) has slashed small scale miners' royalties and the cost of importing cash as part of efforts to improve gold deliveries to FPR and stem the smuggling of the yellow metal. The sole gold buyer and exporter of the yellow metal has also adjusted prices to near prevailing international gold prices giving hope that small-scale deliveries are going to increase.

Small scale and artisanal miners who account for an average of 60 per cent gold deliveries to FPR have commended the gesture by the central bank.

Zimbabwe Miners Federation Chief Executive Officer Mr Wellington Takavarasha said deliveries by small scale and artisanal miners was increasing owing to prices offered by Fidelity.

"With the granting of the right to sell the yellow metal at the prevailing international gold price, removal of punitive taxes and cost of importing cash, gold deliveries had been high,"

"We are happy to tell you that our members were delivering to FPR and were paid on the spot. Last week alone (sometime in June 2021), we delivered over 0.350 tonnes which is a huge jump from other weeks we could deliver less than 0.1 tonnes per week," said Takavarasha.

The central bank is also considering allowing large-scale gold mining com-

panies to directly export a portion of their bullion as the bank gradually eases its control of gold trading in the country a motion meant to increase investment in the gold industry as well as production.

The government has previously said gold worth \$1.2 billion is illegally siphoned from the country annually. With producers of the yellow metal blaming low prices and late payments by FPR for leakages. Efforts that are being made in the gold sector are a clear indication that there is hope for the gold sector to reach its project target by 2023 especially with the rise of Kuvimba Mining House.

Lithium



Zimbabwe is the world's fifth-largest producer of lithium, albeit, with only a single producing mine, the country has the potential to produce 20 per cent of the world's total lithium.

The commission of the Arcadia Lithium Mine pilot plant is set to provide a pathway for Zimbabwe to become one of the biggest lithium producers in the world.

Speaking at the commission of the plant last month, Minister Chitando said the Arcadia mining project is part of Vision 2030 and the US\$12-billion mining economy by the year 2023 and signifies the hard work that the government, courtesy of President Emmerson Mnangagwa who has created a conducive economic environment that has invited foreign investors. The pilot plant according to Minister Chitando will culminate into full lithium production.

Chairman of the Parliamentary Portfolio Committee on Mines and Mining Development, Edmond Mkaratigwa, said the positive progress being witnessed in the lithium sector through is a sign that local policies have been crafted in a way that makes capital comfortable in this country.

"The Second Republic has made it very clear that Zimbabwe was open for business, and the progress being

witnessed in foreign-owned businesses is a sign of commitment to that pledge.

"We continue encouraging other investors across the globe to come and exploit opportunities available in this country. The Zimbabwe economy is being configured for an upper-middle-income society and this is the opportune time for investment," Hon Mkaratigwa said.

There are other lithium projects still at exploration stages namely Zulu Lithium project, Kamativi among other hosts like Mirroplex owned Shamva project near Bindura. With the increase in popularity of the "new oil" as the world switches to electric cars, lithium consumption will grow exceptionally fast as the metal is the principal raw material for modern batteries.

US\$1 Billion in Diamonds

According to the Deputy Minister of Mines Hon Polite Kambamira the ongoing exploration and improving transparency in the marketing of gems means the country diamond sector is heading in the right direction.

The Deputy Minister said there was great hope that the world's biggest diamond producer, Alrosa was in intensive exploration around the country bringing hope that when the company starts to mine to projected target in diamond will be achieved.

Hon Kambamira rubbished reports that Chinese owned diamond miner, Anjin was selling diamonds without the involvement of the Minerals Marketing Corporation of Zimbabwe (MMCZ) saying the corporation has been involved in all the bidding.

"MMCZ was involved. Bidders were invited and all stakeholders were there but only that the prices that the bidders came up with were below our receptive prices.

"Anjin is working well with MMCZ for the marketing of the produce and ZCDC is doing the same. Alrosa hasn't set up a mine yet that is why they are doing much exploration work and for ZCDC there is what we call ongoing exploration same with Anjin.

"There is great hope because like now Alrosa is all over the country conducting exploration, the time they start to mine it will be an explosion," the youthful Deputy Minister said.



US\$1 Billion in coal and hydrocarbons

The pace to which current coal, oil, and gas projects are moving is evidence that government is keen to see speedy exploitation of reserves as the country could be at risk as the world is eager to stop direct funding of the minerals' exploration as it plans to phase out fossil fuel, Deputy Kambamura said.

The Deputy Minister said the extraction of these resources was moving at a large scale as the government was releasing mining claims held for speculative purposes under the use it or lose it policy. The government according to the



Hon Edmond Mkaratigwa

Chitando was developing a coal policy that will facilitate the exploration of coal bed methane gas.

"Current coal projects that are on course and the pace with which they are moving is evidence that government is keen to see speedy exploitation of coal reserves. Coal ground held for speculation is being released for consideration by serious investors who will explore, develop and extract the resource within set timelines and conditions. The government is also developing a Coal Policy which will facilitate the exploitation of Coal Bed Methane gas." Deputy Minister Kambamura said.

Hon Mkaratigwa said it was of importance for the government to consider other ways

of doing business by prioritizing local research, investments and infrastructure development because time was not on Zimbabwe's side to fully utilise her resources in a way that will fully benefit her.

"What we may need is thinking outside the box relative to resource mobilisation and not dependent on traditional lines of credit alone, if we are to survive. Time is limited and if we do it the normal way, we may lose on both ends and if that happens, it will even be more expensive for us as a country.

"In that context that will definitely affect Zimbabwe and we can only speed our preparedness for that time bomb by resourcing the processes including through related local research and infrastructure development, otherwise this will set back our development. Whereas the 24 years have been set, considering the nature of mining projects, in reality, we may only have around 15 years of beneficial use of those resources as many other investments are needed before we finally fully draw meaningful benefits," he said.

Diverse coal, oil, and gas projects are underway with the famous Muzarabani oil and gas project which has made it to the list of this year's Top Five oil and gas wildcat drilling compiled by leading global energy price, research and analysis site, OilPrice.com. The listing in the top global exploration has been welcomed by the government saying it brought optimism that the country will in future be energy self-sufficient, create employment, grow the economy and bring huge downstream benefits.

Chrome, Nickel, and Steel

Nickel mattes and Chrome are performing significantly raking in the momentous amounts meeting projected targets, however, a lot needs to be done to improve the buying of chrome in the country.

Zimbabwe has the second-largest high-grade chromium ores in the world after South Africa with reserves of approximately 10 billion tonnes. The country has more untapped than tapped Nickel deposits.

Steel production can reach the target in this category if plans are in place to revive the sector.

According to Hon Mkaratigwa, it was of paramount significance for the country to consider beneficiation and value addition if we have to achieve the US\$12 Billion mining sector by 2023.

"Beneficiation and value addition of minerals before export is one of the four key pillars of Zimbabwe's goal to create value, employment and accelerated industrial development from its largely unexploited mineral resources.

"We continue to urge companies to use the entire value chain and add value to the minerals which will culminate into the creation of more jobs and revenue for the fiscus," he said.

Other minerals performance

The government is expecting minerals other than the above mentioned to earn US\$1.5 in export sales by 2023.

The coloured gemstone industry in Zimbabwe has been tipped to earn over a billion in export sales but very little has been done to make sure that the potential of the industry to economic revival has been recognised. The performance of the sector in 2020 has somehow been disappointing with MMCZ which is responsible for the marketing of the stones not ready to ensure that a vigorous marketing strategy has been met.

Zimbabwe has one of the largest copper and cobalt reserves in the world and experts believe that Zimbabwe can earn as much as Zambia through its minerals, however, no efforts are done to attract investments in the sector. Copper and Cobalt can be of significance in achieving the US\$12 BILLION target.



Polite Kambamura

Conclusion

There is hope for the mining industry to achieve the US\$12 Billion mining industry roadmap, however, Mining Zimbabwe still recommends the government of Zimbabwe to adopt the following points to make sure that the mining sector moves towards the US\$12 billion industry by 2023.

i) End corruption - Although not much recorded corruption in the sector is too prevalent and the cancer of corruption needs to be dealt with once and for all. To end corruption, the government will need to create and adopt a digital cadastral system that increases transparency.

(ii) Institutionalise the rule of law to end statutory risk - there should be no changes to rules and regulations without wide stakeholder consultations and advance notice.

(iii) Stable economic environment - A stable economy where property rights are respected and policy is consistent will help stabilize the mining sector, thereby leading to the growth of the sector by attracting the right investment.

(iv) Currency must be free-floating and tradable - A floating exchange rate is a regime where the currency price of a nation is set by the forex market based on supply and demand relative to other currencies. This is in contrast to a fixed exchange rate, in which the government

entirely or predominantly determines the rate. The current auction has been a success however more still should be done.

(v) Economic growth - Capital Flows Foreign capital tends to flow into countries that have strong governments, dynamic economies, and stable currencies, therefore, Zimbabwe needs to have a relatively stable currency to Attract investment capital from foreign investors.

(vi) Utilise digital technology - MMCZ should start operating an online store where the minerals at its disposal are known by the public and international consumers. Younger personnel must be introduced in MMCZ marketing as they have a vast understanding of today's digital world.

(vii) Improve geoscientific knowledge by revamping and recapitalising the Geological Survey Dept.

(viii) Partially privatise ZMDC - Although ZMDC is doing a lot to increase production as mentioned in this article, it is Mining Zimbabwe's view that the company should be partly privatized and must be listed on the stock exchange to raise money, and the government ownership gets diluted to less than the controlling shareholder.

(ix) Promote exploration give good tax breaks for companies who put a high-risk exploration \$ into the ground and also consider giving small scale mines

incentives.

(x) Digitalise mining rights, title registration, and all payments - Amidst reports of corruption, money laundering, externalization, and other unscrupulous behaviour by mining personnel, all transactions which are mining-related in Zimbabwe need to be done digitally to avoid corruption and Improve transparency. Minister Chitando said the equipment will be inland by June 2021 we hope its here.

(xi) Fast track formalisation - ZMF claims there are 1 500 000 Artisanal and small-scale (ASM) miners in Zimbabwe. Of which only 40 000 ASM are mining titleholders. If every one of the 1,5 million miners submits just five grams/month to fidelity it equates to 7,5 tonnes or 7 500 000 grammes making it 90 tonnes or 90 000 000 grams yearly and at a going rate of US\$55/gram totalling staggering US\$4 950 000 000/year just from ASM miners! Formalisation should be fast-tracked and made the top priority.

The publication is happy that the government has been working to address most of the points raised however, we are still of the opinion that timely Mining Title issuance, attractive payments (gold) and spot payments (even to LSM) is the pothole free highway to a successful mining campaign and the achievement of the roadmap.



Mines and Mining Development Minister prepares to test drive a backhoe in Kadoma

The potential of the semi-precious stones industry in Zimbabwe

By Lyman Mlambo, Chairman of the Institute of Mining Research



Lyman Mlambo

What are Semi-Precious stones?

To understand semi-precious stones, we need to view them within the context of two closely related terms, precious stones and gemstones. Precious stones are generally understood to be beautiful, translucent, rare and hard crystalline minerals. Only four stones are classified as precious stones and these include diamonds, emeralds, rubies and sapphires. Semi-precious stones are all the other beautiful or quality stones other than these four. However, precious stones are not necessarily more valuable or beautiful than semi-precious stones, and today, are not necessarily rarer.

The distinction between the two classes was conceived in the mid-1800s by the ancient Greeks, with the main distinguishing feature being rarity. Precious stones were rare while semi-precious stones were relatively abundant. Semi-precious stones are also termed coloured stones even though precious stones are also valued for, apart from their translucency, the richness of their colour, except for diamonds that gain more value with greater colourlessness. Generally, the ancient classification (lists of precious stones as distinguished from semi-precious stones) is still being used. The term gemstones includes both precious and semi-precious stones. All gemstones are crystalline.

Resource, Diversity, Occurrences and the Mining of Semi-Precious Stones in Zimbabwe

The resources of semi-precious stones in Zimbabwe are estimated to be vast. Their total value is estimated at US\$20 billion. The country hosts about 33 different types of semi-precious

minerals. The minerals are under-explored (more so than other minerals), so the estimated number of types and value could be way below the actual. These minerals are easily found and mined and are sometimes just collected or picked in the field.

The mining of semi-precious stones in Zimbabwe is dominated by artisanal miners who sell informally to foreign dealers (mainly Zambians, Congolese, Mozambiquans, Pakistanis, Indians and Chinese). The miners do not appreciate the value of these minerals (they think they are essentially value-less) and hence they sell them cheaply to foreign dealers who come to their mining sites, some of whom are members of international cartels. Zambia has a more developed semi-precious stone industry, with a mining company there establishing a massive (precious stone) ruby processing plant in Mozambique. Low quantities of semi-precious stones are coming to the Minerals Marketing Corporation of Zimbabwe (MMCZ), hence the Corporation has not been serious about their marketing, as it is not viable to organize small consignments. MMCZ has no significant database of buyers of semi-precious stones as it does for other minerals.

It is not a straightforward issue identifying semi-precious stones using the naked eye because of the wide range of colours the same semi-precious stone may have. Also, some semi-precious stones are also industrial minerals, so that they are recognized as semi-precious when they are gem-quality rather than industrial quality; examples include feldspar, gypsum, talc, and quartz.

Leading World Producers of Semi-Precious Stones

Zimbabwe is not recognized as a producer of semi-precious stones. The countries or areas noted in this section are not only rich in the indicated stones but are also leading producers. Africa is known for the production of 'tanzanite' emerald, alexandrite, aquamarine, rhodolite and 'tsavorite' garnet and tourmaline. Among some of the producing countries in the African continent are Zambia, Zaire (DRC), South Africa, Sierra Leone, Namibia, Angola, Tanzania, Central African Republic, Kenya,

Mozambique and Madagascar. Semi-precious stones produced in Madagascar include aquamarine, tourmaline, demantoid, spessartite, tsavorite, morganite and colour-change garnet.

Sri Lanka (in South Asia) produces a variety of semi-precious stones including the finest chrysoberyl (cat's eye and alexandrite), moonstone, garnet, topaz, tourmaline, quartz, zircon, peridot, and spinel. Myanmar (also known as Burma, in South East Asia) supplies spinel and imperial jade mainly to Asian countries including Malaysia, Thailand and Singapore. Australia is the biggest producer of opal accounting for close to 90% of the planet's supply. It has a wide range of opals of various colours.

The market for Semi-Precious Stones Just like the demand for gold in its use in the manufacture of jewellery, the main sources of demand for semi-precious stones include India, the USA, China, Middle East (including Dubai), Saudi Arabia, Gulf States, Egypt, Turkey, Italy, Japan, North America and Germany. India, USA and China top the list reflecting the importance of semi-precious stone jewellery in culture and special occasions including Christmas, birthdays, weddings, anniversaries, Valentine's Day, as well as religious festivals.

Semi-precious stones are polished, cut and treated into personal ornamentation items (that is, jewellery) such as necklaces, rings, bracelets and brooches; ornamental appendages to various items such as wristwatches, clothing and other wears, domestic items such as lounge suites, tables, chairs; for general decoration of places such as bedrooms, dining rooms and bars; and for creation of luxury art such as hardstone carvings and collection of antiquities. The cutting, polishing and further treatments enhance the clarity and colour of the stones, their beauty and hence their value.

The market is aware of the existence of imitation or synthetic products which look like the original stones but do not possess the chemical and physical properties of the stones.

QUICK FACT

MMCZ has no significant database of buyers of semi-precious stones as it does for other minerals.

Dynamics noticeable in the global jewellery market and hence semi-precious stones are the increased advertisements through various platforms such as television and the internet, the increased incomes of dealers due to growth in the demand from Asian economies for use as ornaments in their ceremonies, and the drift away from the unorganized product markets (which have been the conventional market) to more organized branded product markets. The last dynamic, evident in emerging economies such as in Asia Pacific, is a reaction by consumers to safeguard themselves from the many counterfeit products flooding the market. Increased spending by the current individual consumers, expected changes in lifestyles by others towards greater ostentation and expanded use in decoration purposes (as the world economy expands), would be the main factors behind a growing demand for semi-precious stones in the near future. Greater market opportunities exist in Latin America, the greater Asia Pacific and Africa, which need to be activated.

Just Gemstone (n.d.) (a) website lists the following as the ten most expensive gemstones (with the list including any qualifying precious stones for comparison) in the world in decreasing order: Jadeite (most expensive at USD3million/carats), red diamonds (USD2-2.5 million/carats), serendibite (USD1.8-2 million/carats), blue garnet (USD1.5 million/carats), grandidierite (USD100,000/carats), painite (USD50,000-60,000/carats), musgravite (USD35,000/carats), bixbite or red beryl emerald (USD10,000/carats), emerald (USD8,000/carats), and black opal (USD2,400/carats). It is interesting to note that two of the four precious stones (ruby and sapphire) do not make it to the top ten, and emerald is second last, demonstrating that the literal designation of gemstones by 'precious' and 'semi-precious' is in practice, at least getting obsolete.

Way Forward on the Semi-Precious Stones Industry in Zimbabwe

Legislative Framework and Developments Realizing the potential semi-precious stones have in contributing to the development of the mining industry and the national economy at large, MMCZ submitted a draft Statutory Instrument (SI) to the Ministry of Mines and Mining Development and the Reserve Bank of Zimbabwe, to formalize the process regarding the extraction and use of semi-precious stones across the whole value

chain. This is a stand-alone piece of legislation from the Precious Stones Trade Act (Chapter21:06), with the latter applying only to diamonds, emeralds, ruby and sapphire. The Ministry reviewed the draft SI and recommended some changes, which changes the MMCZ is working on. It is hoped that the SI would be finalized soon, probably by the end of 2021.

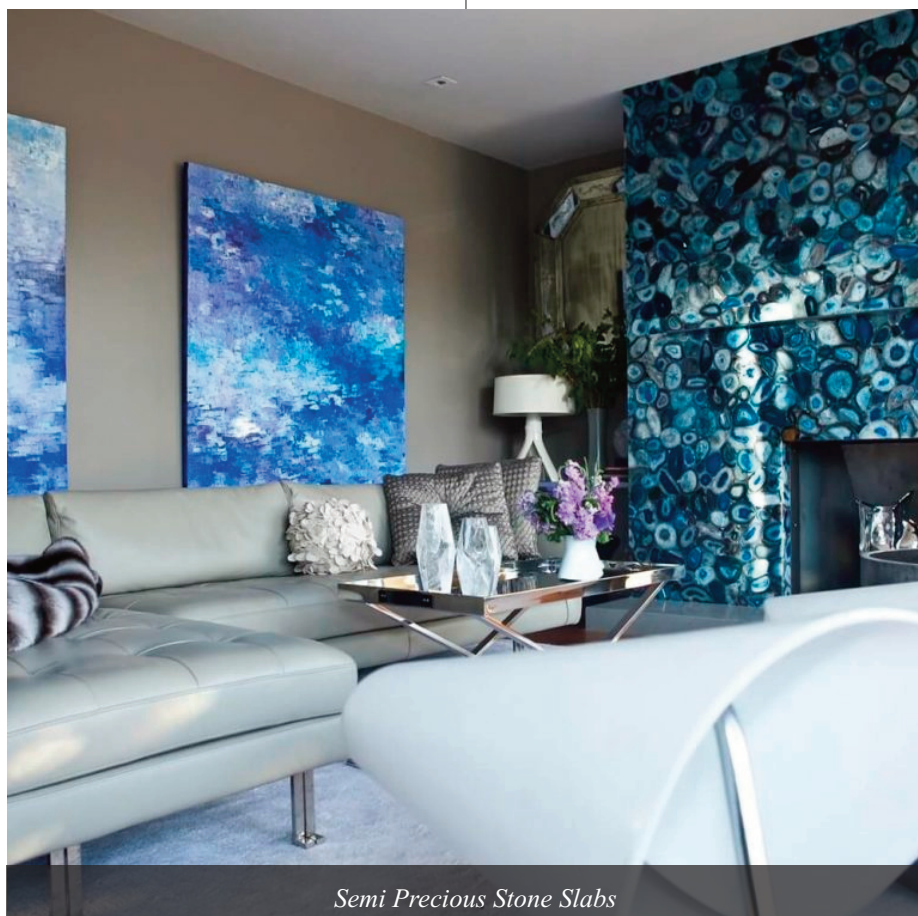
What happens in the meantime if a miner wants to extract and sell the semi-precious stones? The Mines and Minerals Act does not specifically address semi-precious stones. Any prospective miner of semi-precious stones has to apply for a prospecting license, peg and register the claims as base metals. In the case of a farmer making a find of semi-precious stones in his/her farm, currently, the Mines and Minerals Act does not provide for the farmer's right to first refusal – the Act applies as it is. Such new provisions could be in changes that might come into effect after the signing of the Mines and Minerals Amendment (MMA) Bill into law. The formal selling aspect is currently done through MMCZ processes, though the state entity at the moment has a small database of buyers of the semi-precious stones, and has not done much in sales due to the current largely informal nature of the current operations and transactions. Whatever transactions have gone through MMCZ have relied heavily on the miners' own knowledge and connections with the

global market players.

Opportunities for Development of the Sub-Sector

The diversity and richness of the country in semi-precious stones needs to be verified through reconnaissance exploration as well as detailed follow-up exploration. It is quite possible that the country could have more than the known 33 plus semi-precious stones alluded to above and that the occurrences (geographical) and the quantity of resources could be more expansive than is currently estimated. The fact that neighbouring countries in Africa are noted producers of gemstones points to the potential existence of high geological prospectivity in Zimbabwe.

Perhaps, the greatest opportunity that faces the sub-sector in the country is the existence of a big global market which is very lucrative if one looks at some of the prices quoted earlier. With the sub-sector in its nascency in Zimbabwe, there are likely to be opportunities for big finds and lower costs of production as the near-surface semi-precious stones do not require large complicated machinery to mine.



Semi Precious Stone Slabs

To spur this industry forward MMCZ could do the following:

(i) create a market (to market the minerals), in order to stimulate demand – this requires a simple market study and advertising through physical engagement and various electronic platforms, including social media;

(ii) formalize the sector through finalization of the SI that creates a framework for the whole value chain of the semi-precious stones in the country; and

(iii) directly participate in its own right in the whole value chain of this sector (mining, beneficiation and manufacturing of jewellery, ornamental appendages, decorative products and luxury art products) as part of its statutory mandate provided for by the MMCZ Act.

The government in general needs to promote investment in semi-precious stones by creating a conducive investment environment. Geological prospectivity is the first and necessary condition for attracting investment to the country.

However, the second and sufficient condition is the policy environment which should be complete (in terms of the governing instruments), competitive (in terms of the fiscal regime and the ease of doing business) and stable so that long-term large investments in exploration, mine development, production and beneficiation can be attracted. Government, for example, needs to complete the National Minerals Development Policy, the Mines and Minerals Amendment Bill, and in conjunction with MMCZ, the SI. There is a need to enhance the country's spatial infrastructure (road, railway and air

transport) and make utilities (power, communication and water) accessible and affordable. There is also a need to directly promote wider investment (local private and foreign direct investment) in the mining, beneficiation (cutting and polishing) and the local manufacturing industry utilizing semi-precious stones. This can be done through targeted fiscal incentives, higher foreign exchange retention levels, and the granting of economic zone status. The world's largest ethically sourced gemstone producing company, Gemfields plc, has some major interests in Zambia and Mozambique, Zimbabwe's close neighbours.

Demonstration of the resources the country has and provision of a competitive investment environment can easily woo such a giant to extend its interests to Zimbabwe.



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A longing for intersectoral growth and the mirror of realities



The journey is long, expectations are high and the future is bright. Zimbabwe pins most of her hopes for sustained economic growth on the mining sector. Agriculture on the other hand is indisputably important both for a healthy workforce and the multifaceted general sustenance of the economy. Analogies are mostly drawn between agriculture and mining. The twin sectors are usually pitched at par comparatively speaking. As a result, the mining sector stakeholders advance the idea that the sector and in particular small scale and artisanal mining, has to be adapted to a government-driven command element as is the case with the agricultural sector. Facts and opinions form the basis of much of the discussion and waging into the debate as a country is equally important.

By Edmond Mkaratigwa & Dr Albert Maipisi

There is no doubt that industrialization drives economies. Mining and agriculture as sectors of the industry, and broadly the economy, are equally important for Zimbabwe among others. Due to the central positions given to these two sectors in the country, they are also comparable, hence the idea that command agriculture can work towards arousing these giants for further economic effectiveness, production efficiency and overall national development.

Those advancing this view mainly seek to address the capitalization aspect of the small scale and artisanal mining sector. Such justify by noting that these miners mostly use rudimentary mineral extraction and processing methods which culminate to lesser production output per given period. Where these groups are perpetually working is further assumed to indicate that the areas are mineral-rich. Their activities are therefore precursors to large scale mining investment potential areas identification. In that respect, the anticipation is that there is no support for

small scale and artisanal miners to grow beyond their current level through government support except through their own initiatives. Possibility for meaningful growth through the latter option being very slim.

The agricultural sector provides many lessons which can be borrowed by the mining sector for learning. Agriculture has received command support in terms of finance, equipment and inputs. Small scale or communal farmers have received different supports such as cattle for herd building, goats for breed improvement, seeds and fertilizers, just to mention a few. These supports have helped the vulnerable communities to be food sufficient. Unfortunately, that has not been graduating most of them, to a better position in which they would be able to reinvest on their own for future production. It is understood that food sufficiency has other indirect benefits to household income levels and that should add to existing capacities for reinvestment at least into the next season. A closer look at the recent Pfumvudza Programme confirms that indeed resultantly there is a remarkable bumper harvest.

Comparing that with the mining sector, mining requires more initial resource investment including for the small scale and artisanal miners when compared to communal and small-scale agriculture. That basically implies fewer people can benefit per time in the agricultural sector. In addition, agricultural land is naturally much more and not fully utilized. Even more, can equally be harvested from a small piece of land in cases where intensive investment is made. Regarding mining, the piece of land allocated for exploitation is usually not flexibly expandable where the miners might discover that they need more, for example when they use the necessary equipment and technological support. In the context that the government wants to achieve both small-scale and artisanal mining sector investment sustainability, those are some of the challenges which need to be thought through even further. Land in agriculture is reusable and minerals are in contrast an exploitable non-renewable resource.

The fact that small-scale and artisanal miners are to a lesser extent many when compared to small-scale farmers, agriculture cuts across almost every household hence its direct impact to the

economy is easily felt and seen. There are many command-driven investments in the agricultural sector. However, small-scale and artisanal mining equally has its indispensable place as one of the key building blocks of the national economy. More organized and coordinated mining sector production is therefore pertinent for sectoral growth and national development. In the agricultural sector and in particular, among small-holder farmers, the nature of landholding is more static and in the mining sector, there is more nomadism and therefore the need to adapt whatever programme to those conditions.

Like the agricultural sector also, the mining sector is positioned highly in national economic plans but arguably less is being done towards the small, medium and artisanal miners in support of the sector's strategic role in the economy. Agriculture has received implements, inputs, training, resuscitation and other expansion supports and that is not meaningfully happening towards its twin industry.

As a result, whereas he who should control the economy's prices is to a greater extent the producer and the buyer, in a less organized production sector the market can be hugely controlled by the middlemen. It is therefore important to organize and strengthen mineral producers. That is said conscious that national economies are naturally influenced by national policy, geopolitics and economic confidence. Agriculture has many of those associations and some of them have even existed over many years. The mining sector equally has associations and they need to get adapted support just as the agricultural sector. Confidence building in the economy is not only a government's prerogative but that of both the private and public sectors and particularly where they are effectively organized.

[Edmond Mkaratigwa (Ph.D. Candidate of Energy, Innovation and Sustainable Technologies and Chairperson of the Parliamentary Portfolio Committee on Mines and Mining Development) & Albert Maipisi (Ph.D. in Disaster Management and Public Administration)] & Published ideas are views of authors and unattributable to their current positions.

Good corporate governance and sustainable development in the mining sector



Francis Shingi Nhunzvi

Mining is one of the most productive and lucrative industries in the world. According to the Global Mining Market Report 2021, the global mining market is expected to grow from \$1641.67 billion in 2020 to \$1845.55 billion in 2021 at a compound annual growth rate (CAGR) of 12.4%.

By Francis Shingi Nhunzvi (CMILT)

The growth is mainly due to the companies rearranging their operations and recovering from the COVID-19 impact, which had earlier led to restrictive containment measures involving social distancing, remote working, and the closure of commercial activities that resulted in operational challenges. The market is expected to reach \$2427.85 billion in 2025 at a CAGR of 7%.

If it can't be grown, it has to be mined. This basic statement places more emphasis on the importance of agriculture and mining: The modern world wouldn't be what it is today without mining activities, we simply can't function without mining. Much of our day to day lives depend on mining elements that provide resources that are essential to our basic needs in the high-tech world we are living in. Mineral products are essential components for cell phones, cars, energy towers, solar panels, wind turbines, nails, tools, screws, water pipes, fertilizers, machinery and all kinds of construction materials. All these things are made from diamond, silica, iron, zinc, chrome, PGMs, nickel, gold, copper, and aluminium etc.

With billions of dollars at stake, the right things must be done the right way by implementing a set of rules and policies in order to achieve the triple bottom line. With these systems in place, the long-term interests of the company are maintained,

investor confidence is boosted and there is also the enhancement of value for other stakeholders.

Environmental, social and corporate governance are important and integral aspects of company performance.

Corporate governance is defined as a system of direction and control that dictates how a board of directors governs and oversees a company. It is a process and structure applied in running a company with the main objective being to increase shareholder value in the long term by paying attention to the interests of other stakeholders. Accountability, Transparency, Fairness and Responsibility are core elements of Corporate governance. Many academic studies have concluded that well-governed companies perform better in commercial terms.



In short, everyone benefits from good corporate governance.

Whilst there are many essential elements to effective corporate governance across all sectors, this article will focus on mining companies' responsibility to the shareholders in the communities in which they operate.

There is a general perception that mining companies only look out for themselves whilst the citizens have to bear witness to their environment being invaded, degraded, destroyed and they also have to be displaced from their homes. It is on record that mining contributes to erosion, deforestation, loss of biodiversity as well as acid mine drainage. All of which can lead to substantial environmental and human health problems.

Mining can impact local communities both positively and negatively. While

positive impacts such as employment and community development projects are important, they do not offset the potential negatives and the balance can be subject to debate if corporate governance issues are not taken seriously. Mining can negatively affect people especially through environmental issues that can include erosion, formation of sinkholes, loss of biodiversity, and contamination of soil, groundwater and surface water by chemicals from mining processes or by simply forcing them from their homes and land.

Governments are responsible for providing human security requirements for their citizens yet most state governments worldwide have been weak in protecting these communities from the mining companies' environmental malpractices. Mining companies that operate in rural communities especially in most African countries must equally share this responsibility. The biggest issue being mine rehabilitation. Mine rehabilitation is the process of repairing the damage done by mining activities. This can sometimes involve making the site safe and stable, however global best practice strives to create a landscape that can support future uses of the land.

Whilst many mining companies have been engaging in Corporate social responsibility drives; they often fall into the usual patterns of CSR that include sponsorship of national sports teams and food donations without paying attention to real community development and mine rehabilitation issues. Oftentimes, crucial infrastructure such as schools, clinics, boreholes and roads are non-existent.

With proper corporate governance structures and responsibility for the communities in which they operate, social consequences can be avoided by ensuring that the local community benefits from the mining activities.



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With proper corporate governance structures and responsibility for the communities in which they operate, social consequences can be avoided by ensuring that the local community benefits from the mining activities.

Mutual benefit is key.

Many mining companies employ the locals but their employment rarely lifts people out of poverty as they lack the in-demand specialized skills. They are instead employed in low-paying jobs because of their skills and qualifications. From my experience in the mining sector, the in-demand specialized professions such as geologist, mining engineer, metallurgist, supply chain, surveyors etc are not available from the locals but they are always crying foul if the company hire from outside. What is needed here is for the locals also to develop interest and train for such skills to fully participate and benefit from such operations.

A great number of families who reside in the rural mining communities in most African countries are vulnerable and have little to no income-generating activities. This vulnerability has resulted in many children participating in illegal mining activities in order to help their parents. Mining companies need to look at creating sustainable income-generating projects for the local community so that even after the life of the mine, they still have something to sustain their livelihoods. We have seen one such concept, the community share ownership trust (CSOT) being implemented by the Zimbabwean government in trying to get mining companies to give back part of their proceeds to the community for developmental purposes. Although not 100% effective due to cash flow and profitability challenges, we still commend the Zimbabwean government for coming up with such initiatives and mining companies for the support.

According to an article by the Silveira House Jesuit Social Justice and Development Center- Community Share

Ownership Trusts, an Economic hope for mineral-rich communities;

In recent decades, the international and regional bodies have come up with economic frameworks to bolster community benefit from mineral resources around them. The International Council on Mining and Metals (ICMM) and African Union (AU) Mining Vision (AMV) of 2009 are some of the mechanisms put in place. They stipulate that mining firms should contribute to the social, economic, and institutional development of the communities in which they operate. Following such initiatives, Zimbabwe is one of the countries that came up with a community-benefit scheme, in the form of Community Share Ownership Trusts (CSOTs). Initiated in 2012, CSOTs are meant to act as vehicles of community development using proceeds from mining activities within each district. Unfortunately, those districts without mining activities have had white elephants CSOTs. (February 2021).

The extractive and destructive nature of the mining industry should be accompanied by good corporate governance that focuses on responsibility for the local community. Appropriate initiatives such CSOTs must be put in place in order to change people's lives and end the poverty cycle trap.

Housing is a big issue for the local communities as they do not have a choice and they often end up living close to the mines thereby resulting in them being exposed to inhalation of toxic elements in the air. Relocation can be difficult, no matter the situation attached to it. In this case, mining companies face many challenges when it is necessary to move a community from the location where new operations are starting up. They have problems with the emotional event of uprooting people from their homes and

often are asked whether or not it is socially acceptable.

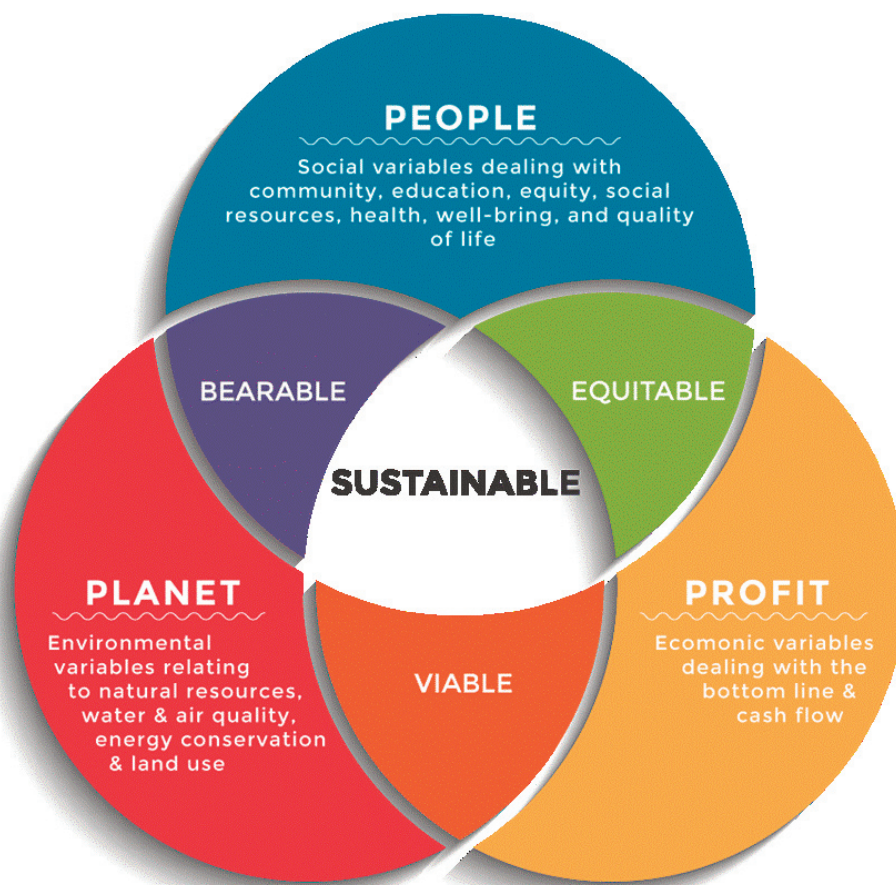
According to an article by Marcela De Vivo (2013), an enviro editor Chinalco, a Chinese mining company, recently needed to relocate the town of Morococha, Peru. The company built an entirely new town for the relocation of 5,000 citizens, but approximately 600 residents, mostly families, did not want to move. This project cost \$50 million and boasts at least the same, if not an improved living standard for the community in the new location, the relocation promises electricity, running water and the opportunity to own property.

Even so, these residents have continued their protests, sometimes even blocking roads into the city and presumably putting all of Chinalco's projects to a halt, not allowing the company entry into the city. The residents reason this by saying the houses are too small and that small businesses are going to seriously suffer in the new location. Beyond that, there is the overall upset at the displacement of a long-standing community.

During the course of the project, Chinalco could generate \$7.6 billion in tax revenues. This revenue not only benefits the company but the community of Morococha. Yet, one has to wonder if the company is actually being socially responsible and fair in their relocations.

We have realised that so many mining companies face criticism and severe backlash when it comes to relocations, with non-profit human rights and other civic organizations quick to cite human rights abuses, lack of community and environmental care, but the truth is that many companies incorporate social responsibility as an integral part of their business.





Rio Tinto has been viewed as one of the mining giants which heavily consults with the communities they wish to mine in before relocation takes place and conduct studies to make sure the transition is as smooth as possible. According to the International Resource Journal, RZMurowa, a diamond mine in Zimbabwe that used to be owned by Rio Tinto, is the epitome of what proper relocation should look like. RZMurowa won the Zimbabwe National Chamber of Commerce (ZNCC) Best Social Responsibility Programs Award for 2009 for its programs that focused on employee welfare and HIV/AIDs prevention in the local community.

There is a need to address the concerns of the citizens in the mining community by using a Human-Centred Design approach. This will in turn result in comprehensively addressing the concerns of the citizens in the mining communities by developing and implementing programs that ensure sustainable livelihoods whilst keeping an

eye on the company's long-term goal of profitability.

Good corporate governance and responsibility to the local community builds trust and will result in poverty reduction, grow the economy and ensure sustainable development in the community as well as improved corporate sustainability performance (CSP). CSP consists of economic, social, and environmental sustainability performance popularly known as the Triple Bottom Line (TBL)

WHAT IS THE TRIPLE BOTTOM LINE?

The TBL is a very interesting business aspect that resulted in so many research studies being carried out to investigate the effect of good corporate governance (GCG) on corporate sustainability performance (CSP). It is a business concept that directs firms not to solely focus on generating profit but on how it is generated by also

measuring their social and environmental impact in addition to their financial performance. It can be broken down into "three Ps": profit, people, and the planet. Modern-day organisations have shown time and again that it's possible to do well by doing good.

Many mining firms have reaped financial benefits by committing to good corporate governance and sustainable business practices.

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Fundamentals of mine planning

The very irregular geometry of most mineral deposits complicates mine design and operation. The higher the degree of irregularity, the more difficult it is to extract the entire resource cleanly with no dilution. Mining Recovery is the percentage of the full resource which is actually mined and processed.

Mine design has three primary objectives:

- **Safety**
- **Economics**
- **Mineral Resource Utilisation**

The design process is based on a risk assessment in respect of each of the above parameters. All human activity contains inherent safety risks and a decision not to mine is the only way to totally avoid safety risk but brings no economic benefit to the stakeholders. However, safety must be paramount in the design of any mine, even though it may preclude the lowest cost options that may be available. Furthermore, poor safety performance always impacts negatively on operating economics.

Artisanal and small-scale mining activities, which are often conducted illegally with regard to mineral rights and licensing, are prone to abysmally low health and safety standards. It is technically feasible to conduct them safely and this will improve economics. No human life is expendable and, quite simply, mining should never be carried out at all where it cannot be done safely.

Mineral resource utilisation refers to the optimum use of the available resource. It is seldom feasible to achieve a mining recovery of 100% or to totally avoid dilution of ore with waste or low-grade material. There is an often trade-off between this aspect and the economics of mining. It may be difficult for governments to accept that some potentially valuable material has to remain unexploited; equally, governments need to guard against operators maximising profits by leaving behind otherwise valuable resources, as discussed in the notes on Mineral Compliance. This objective is further complicated by the cycles of variation in commodity prices.

A simple example of mining recovery is the need, with some U/G mining methods, to leave pillars of ore to support the excavation. In some U/G coal mines, only 55% of the seam may actually be mined. Whilst the activities of artisanal and

small-scale miners (ASM) can provide useful information on a mineral resource, they can also render it difficult for large-scale operators to later exploit them safely and economically. The ASM sector typically mines without any formal planning, alternating between surface and U/G mining methods as they follow an orebody, and often extracting small portions which might be ignored by larger operators.

The overriding factor in the formal, technical design of mines is the physical characteristics of the orebody: shape, size and depth below the surface, followed by structural competence of the orebody and country-rock. The first decision facing mine planners is whether to exploit an orebody by open-pit or underground methods and this decision is heavily influenced by these factors.

Infrastructural considerations such as availability of power and water, as well as the availability or otherwise of skills and readiness of access to equipment and materials, all influence design decisions.

Other important factors include environmental and social considerations. Open-pit mining tends to disturb large areas of the surface for both the pit itself and for the disposal of large volumes of waste rock usually mined from pits, with both social and environmental implications. Underground caving methods may result in large areas of surface subsidence with similar consequences. Some mining methods consume more water and energy than others.

Mine closure planning should be incorporated in the initial design, which should consider ultimate land use after closure and rehabilitation.

Planning of large mines is carried out by teams of specialists with a wide range of skills from technical to financial, health, safety and environment and others. Technical skills may include, in addition to geologists and mining engineers, mechanical, electrical and civil engineers, ventilation specialists and geotechnical engineers.

The laws of some countries require operators to submit a mining plan or feasibility study for government approval ahead of the construction of a new mine. Other countries accept that the investor carries the main risks associated with his

planning, and monitor only compliance with legislative requirements.

Scale of Operations

Defining the size of a mine is a complex topic and may involve a number of different parameters. Some countries' minerals laws or regulations contain definitions, for legal purposes. Technically, mines are commonly classified according to the amount of ore mined annually or monthly: kt/A, kt/M or Mt/A. It is also common to refer to tonnes treated, which simply means the amount of ore mined and processed. It is important to distinguish between tonnes mined or treated and production:

- A gold mine might treat 100kt/M of ore and produce 900kg of gold;
- A copper mine might mine 10Mt/A of ore and produce 108kt/A of cathode copper.

Media reports often get this wrong and will say, for example, that a platinum mine has reserves of 100Mt of platinum group metals, when in fact it has reserves of 100Mt of ore at a grade of, perhaps, 5g/t, i.e. containing 500,000 kg (about 16 million oz.) of PGMs.

In planning the size of a new large mine, investors are influenced chiefly by the size of the known resource and the funding available to construct the mine, processing plant and associated infrastructure. In general terms, it is often beneficial to maximise production rate, i.e. extract maximum ore per annum, thereby shortening the operating life of the mine, due to the time value of money, i.e. a dollar earned in ten years is worth more than one earned in twenty years. However, this decision must be balanced against sober consideration of capital availability and the size and availability of equipment needed to achieve a given level of output, and the skills available to operate and maintain the equipment.

Furthermore, in both open pits and underground mines, there are physical constraints on the rate at which workings can be deepened. Planners must consider the drop-down rate, i.e. the average vertical depth in metres of the portion of the orebody being extracted annually. Limited points of attack may restrict the drop-down rate.

It is quite common for the initial design of a mine to be for a given rate of production, with the option of a later uprate or increase in production rate. This approach has the advantages that capital expenditure is deferred, increased technical information and confidence is available for planning the uprate, the business environment is better understood, skills can be developed during the earlier phase, and cash generated from earlier operations can fund the capital required for the production increase. Both mining and processing facilities can be designed on a modular basis to facilitate increases in output. However, this approach can sometimes adversely affect the costs or efficiencies of attaining higher production levels. Physical constraints may also arise when planning increased output, e.g. installed power capacity, the capacity of shafts in underground mines, which are difficult to upgrade. In planning to increase output from an underground mine, ventilation requirements are frequently a major constraint.

Life of Mine (LOM) Plan: a company will normally produce an initial mining plan forming the basis of its business plan. This would be included in a feasibility study, where applicable.

Generally, the Life-of-Mine plan is based on a Depletion Schedule which starts with the mineral resource statement, showing the tonnes of ore, grade, and valuable mineral content. The schedule then shows depletion of the resource over the Life-of-Mine period, showing annual tonnes mined or milled, grade, contents, recovery and production of saleable product. The initial period, perhaps one to three years, is often shown in more detail, monthly or quarterly.

There are many benefits to maintaining a steady rate of production over the Life-of-Mine but the initial phase, typically one to five years, often has a ramp-up period, during which production is progressively increased toward full design capacity. The example below shows a very simple LOM model of a copper mine with a life of seven years, including construction with no production in Year 1 & 2, and a ramp-up phase in Years 3 & 4.

EXAMPLE OF A LOM DEPLETION MODEL

A mine reports a measured resource of **15Mt @ 2.00% Cu**.
So contained copper = **300kt**

YEAR	3	4	5	6	7	TOTAL
Tonnes mined (Mt)	2.0	3.6	3.6	3.6	1.2	14.0
Grade % Cu	2.20	2.16	2.12	1.98	1.88	2.09
Cu metal in ore (kt)	44.0	77.8	76.3	71.3	22.6	291.9

Resource not mined = **1Mt @ 0.9% Cu, containing 8.1kt Cu**

In this example, some 2.7% of the resource (measured in contained copper) is not extracted.

The depletion schedule forms the basis for additional annual schedules which are used to build the life-of-mine model, including:

Development metres annually (U/G mines)	Waste rock & overburden stripping (open pit mines)
Manpower requirements	Major equipment requirements
Energy & water requirements	Waste rock & tailings disposal volumes
Capital expenditure	Operating expenditure
TECHNICAL INPUTS	FINANCIAL INPUTS

Technical inputs, together with a host of financial assumptions, are used to calculate annual capital expenditure (CAPEX) and annual operating expenditure (OPEX). These are used to generate a LOM Financial Model.

REVENUE (INCOME) (\$M)

YEAR	1	2	3	4	5	6	7	8	TOTAL /Ave
Tonnes mined (Mt)			2.0	3.6	3.6	3.6	1.2		14.0
Grade % Cu			2.20	2.16	2.12	1.98	1.88		2.09
Cu metal in ore (kt)			44.0	77.8	76.3	71.3	22.6		291.9
Recovery %			96	96	96	95	95		95.7
Cu in cons sold (kt)			42.2	74.6	73.3	67.7	21.4		279.3
Cu Price \$/lb			3.00	3.00	3.00	2.80	2.80		2.94
\$/t			6,614	6,614	6,614	6,173	6,173		6,482
Revenue (\$M)			279.1	493.4	484.8	417.9	132.1		1,807.3

EXPENDITURE (\$M)

YEAR	1	2	3	4	5	6	7	8	TOTAL
Constr. CAPEX	200.0	400.0	0.0	0.0	0.0	0.0	0.0		600.0
Replacement CAPEX (2%)			12.0	12.0	12.0	12.0			48.0
OPEX (\$40t/MILLED)			80.0	144.0	144.0	144.0	48.0		560.0
TOTAL CASH OUT	200.0	400.0	92.0	156.0	156.0	156.0	48.0		1,208.0

OPEX, also called Operating Costs, is the direct cost of operating the mine over a period of time. There are many other indirect costs such as financial costs and taxation, which have been dramatically simplified in the above example. CAPEX is the cost of constructing the mine, processing plant and associated infrastructure. The bulk of this expenditure accordingly occurs at the start of the project, ahead of production. However, some CAPEX continues throughout the life of the mine, on replacement and overhaul of major equipment and facilities, special projects and, in some cases, increasing capacity.

In reality, a LOM plan is far more complex and comprises a series of very detailed

CASH FLOW (\$M)

YEAR	1	2	3	4	5	6	7	8	TOTAL
CAPEX	(200.0)	(400.0)	(12.0)	(12.0)	(12.0)	(12.0)			(648.0)
OPEX			(80.0)	(144.0)	(144.0)	(144.0)	(48.0)		(560.0)
TAX & ROYALTIES TO GOVT.			(56.5)	(99.5)	(97.3)	(79.9)	(24.7)		(357.9)
TOTAL CASH OUT	(200.0)	(400.0)	(148.5)	(255.5)	(253.3)	(235.9)	(72.7)		(1,565.9)
REVENUE			279.1	493.4	484.8	417.9	132.1		1,807.3
SALE OF ASSETS								100.0	100.0
NET CASH FLOW	(200)	(400)	130.6	237.9	231.5	182.0	59.4	100.0	341.4

spreadsheets accompanied by explanatory text which may explain assumptions and discuss decisions made in selecting options reflected in the plan.

The LOM plan is a dynamic document. Although large mines prepare a LOM plan at the start of the project, covering the full intended life at that time, they are usually updated annually, taking into account changes, e.g. additional resources identified, new technologies applied, changes in projected commodity prices.



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