Economic Diversification: The Case of the Zambian Mining Sector

Submitted to the

Committee on National Economy, Trade and Labour matters

By the

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1. Introduction

This memorandum provides ZIPAR's submission to the committee on National Economy, Trade and Labour matters on the topic "Economic Diversification: The Case of the Zambian Mining Sector." The submission is not restricted to but broadly covers the following areas:

(i) Introduction to the concept of economic diversification in Zambia;
(ii) The adequacy of the policy and legal framework governing the diversification of the Zambian Mining sector;
(iii) Information regarding what mineral resources are found in Zambia;
(iv) To what extent these minerals have been exploited and what their contribution is to the national economy;
(v) The suitability of the investment climate for the non-copper mining sub-sector;
(vi) Challenges faced by the non-copper mining operators;
(vii) Opportunities that are available in the non-copper mining sub-sector;
(viii) Impediments to growing the non-copper mining sub-sectors' contribution to the economy; and
(ix) Strategies that should be put in place to enhance the contribution of the non-copper subsector to the economy.

The memorandum used qualitative and quantitative methods in undertaking analysis. The data used was drawn from various sources among them Ministry of Mines and Minerals Development, Bank of Zambia, and the Zambia Development Agency. We also undertook key informant interviews with some stakeholders in the mining industry.

The rest of the paper is structured around the broad themes highlighted above.

2. Economic Diversification in Zambia

Economic diversification is defined as the process of shifting an economy away from a single income source towards multiple sources from a growing range of sectors and markets. Traditionally, it has been applied as a strategy to encourage positive economic growth and development. Economic diversification is recognized in literature as a strong determinant of economic development[1].

For Zambia, economic diversification offers opportunities to realise additional jobs and benefits from Zambia's vast endowment of natural resources. Diversification provides the opportunity for Zambia to benefit from a stronger and more diversified economy that supports a strong manufacturing base. Diversification in the mining sector can offer opportunities for value addition through forward linkages to manufacturing and agro

[1] Ali and Cartner (2020). Economic diversification and human development in Europe. Available at https://link.springer.com/content/pdf/10.1007/s40822-020-00147-0.pdf

processing, and increased production and exportation of non-traditional exports to domestic and international markets.

However, Zambia has achieved minimal economic diversification over the years. This is evidenced by the concentration of economic output in the tertiary and primary sectors. It is even more evident in the mining sector where copper continues to dominate traditional primary commodities.

Unfortunately, the production, processing and export of other minerals remains underdeveloped. The Government is cognisant of the challenges relating to diversification of the mining sector in the country. The now expired Seventh National Development Plan (7NDP) which ran from 2017 to 2021 placed emphasis on broadening the range of minerals to cover non-traditional mining of gemstones, gold and industrial minerals as well as promotion of value addition to mining products. The plan indicated activities such as scaling up of mining of iron ore and also supporting the growth of the newly declared Kafue Iron and Steel Multi-Facility Economic Zone. The plan also highlighted a focus on formalising and empowering small-scale miners to make them more productive, supporting development of lapidaries and local auction sales of gemstones and enhancing the capacity of local businesses to participate in the mining value chains and boost export revenue. A quick scan through production and export figures for non-copper minerals which we highlight in ensuing sections shows that the status quo with respect to the dominance of copper mining remains the same. It is indicative of the need for concerted efforts to diversify the mining sector.

3. The adequacy of the policy and legal framework governing the diversification of the Zambian Mining sector

Zambia's mining industry is principally regulated by the Government through the Mines and Minerals Development Act No. 11 of 2015[2]. The Mines Act provides for the administration of the mining sector and includes the establishment of the offices of the Director of Mines, who is the chief administrator responsible for securing proper development of mines and conduct of mining operations in accordance with the provisions of the Mines Act. The Act also provides for the office of the Director of Geological Survey, who is responsible for undertaking the geological mapping of Zambia and the exploration operations on behalf of the Republic, advising the Minister on geological matters and providing data concerning the geology and mineral resources of Zambia. The Director of Mines Safety supervises matters relating to the environment, public health and safety in exploration, mineral processing and mining operations. There is also the Director of Mining Cadastre who is responsible for the administration of mining rights and mineral processing licenses. The Mines Act also establishes a Mining Licensing Committee, which considers applications for mining and non-mining rights and all matters related to the administration of mining and non-mining rights (e.g. suspension, termination or amendment of the licenses. The primary regulatory body for the mining sector is the Ministry of Mines and Minerals Development.

Beyond the Ministry of Mines and Minerals Development, there are several other Government institutions that play different roles in the mining sector according to their varying mandates. These include the Zambia Development Agency, the Zambia Consolidated Copper Mines Investment Holdings, Industrial Development

[2] See Mines and Minerals Development Act (2015) Available at https://www.parliament.gov.zm/sites/default/files/documents/acts/The%20Mines%20and%20Minerals%20Act,%202015.pdf

Corporation and the Bank of Zambia (Gold purchases). In terms of the institutional architecture, the Mines and Minerals Development Act of 2015 has provided for a comprehensive list of institutions to govern the sector. However, a number of challenges arising from capacity constraints in the institutions mandated to regulate the (non-copper) mining sector in Zambia persist. For instance, there is poor handling of environmental and social impacts of mining, problems with human rights associated with the sector, ineffective development planning as it relates to mining, issues concerning land access compensation and resettlement as well as the absence of revenue sharing between national and local Government[3].

With respect to the adequacy of the legal framework governing the non-copper mining sub-sector as enshrined in the Mines and Mineral Development Act of 2015, we note that the Act has certain inadequacies concerning regulation of licenses in Part IV of the Act. The Act does not give surface rights holders priority to apply for exploration rights on the land they hold and also gives them less legal room on exploration rights on their land. That goes against Government intention of citizen participation as people are displaced from their land to give way to foreign interests in mining when citizens could equally be encouraged to have stake in the operations. Further, citizens are not given mineralisation information about their areas, meaning that they can't start exploring what they do not know. As such, established informed firms with exploration licenses come and the locals have to give way. We also note that Article 24 of the Act which allows mineral exploration license holders to keep renewing their licenses and only cede 50% at each renewal point encourages speculative holding of licenses which we discuss (later on) as one of the challenges in the sub-sector.

From the perspective of the investor community, some of the challenges arising from the regulatory framework with respect to mining include inadequate fiscal and tax stability as well as the poor management of licenses including disconnects between the requirements of different ministries.

3.1. Mining Tax Regime

Allied to the legal framework for administering the mining sector in the country is the fiscal regime which governs the revenue aspects of the industry.

2.1.1 Historical Tax Regime

Zambia's mining tax regime has undergone several changes over the years with the most notable changes coming after privatisation in the early 1990's. While these changes have largely affected copper mining, they have also had an impact on the non-copper mining subsector. Some of the most notable changes to the country's mining fiscal regime from the year 2000 are briefly discussed below:

(a) Post-Privatization Regime: 2000-2008 (The Development Agreements (DAs) negotiated with individual mines at privatization)

After privatisation, agreements were made between the Zambian government and each company that bought the assets of Zambia Consolidated Copper Mines. While these agreements have never been made public by the Zambian government it is argued that tax rates and other details for each company differed to some extent.

[3] See World Bank (2016). Zambia Mining and Investment Governance Review. Available at https://openknowledge.owr;dbank.org/bitsstream/handle/10986/24317/Zambia0mining00review00final0report.pdf?sequence=6

(b) The 2008 Regime

In the year 2008, the Government imposed a new tax regime for the mines by enactment of the Amendment Act No.7 of 2008 which increased the company income tax rate from 25 per cent to 30 per cent. Deductions also changed as follows: Depreciation allowance was cut from 100 per cent to 25 percent; Hedging operations were to be taxed separately from mining operations; losses could be carried forward for a maximum of 10 years instead of 10 to 20 years; the Mineral Royalty rate for copper and cobalt was increased from 0.6 per cent to 3 per cent; windfall tax was introduced.

(c) The 2009 Regime

Under the 2009 reforms the key changes included abolishment of windfall tax, tax depreciation reverted to 100 per cent and mines were again allowed to combine hedging and operating income for income tax purposes.

(d) The 2012 Regime

The two main changes for the mining industry tax regime were: The mineral royalty rate for copper and cobalt was doubled from 3 per cent to 6 per cent; hedging and operating income were again to be treated separately for income tax purposes.

(e) The 2015 and 2016 Mineral Royalty Regime

In the 2015 Budget, the Zambian government revised its tax regime structure by replacing the 2012 regime that combined mineral royalty tax (at 6 per cent) and corporate tax (at 35 per cent) with a single system of the mineral royalty tax at 20 per cent as the final tax. The structure of this regime was similar to the 2012 regime but the difference was that it responded to low market prices.

2.1.2. Current Policy Regime (2019-2022)

In September 2018 Zambia was faced with large fiscal deficits and external borrowing that led the International Monetary Fund to caution that Zambia was at high risk of debt distress. The Government, once again, turned to the mining sector to boost revenue. When presenting the 2019 National Budget, the Government introduced the latest policy changes to the mining fiscal regime. Until then, the mineral royalty rates ranged from 4 percent to 6 percent depending on the copper price. The new tax changes, effective 2019, included the following:

(a) Increased mineral royalty rates by 1.5 percentage points at all levels of the sliding scale.

(b) Introduced a fourth-tier rate at 10 percent on the sliding scale mineral royalty regime which would apply when copper prices rise beyond US$7,500 per metric tonne.

(c) Made mineral royalty tax non-deductible for income tax purposes.

(d) Introduced an import duty at the rate of 5 percent on copper and cobalt concentrates.

(e) Introduced an export duty on precious metals (which included gold, precious stones and gemstones) at the rate of 15 percent.

(f) Lifted the suspension of the export duty on manganese ores and concentrates which was put in place in 2012 and increased this duty from 10 to 15 percent.

The 2022 Budget had proposed to amend the Mining Fiscal Regime by introducing the deductibility of mineral royalty for corporate income tax assessment purposes. The proposed measure is in line with international best practice, and is also aimed at attracting investment and boosting production in the mining sector. Table 1 summarises the mineral royalty prior to and from 2019.

Table 1: Mineral Royalty Sliding Scale

Norm Price Range	Royalty Rates	
	Previous	New
Less than US$4,500	4.0	5.5
US$4,500 but less than US$6,000	5.0	6.5
US$6,000 but less than US$7,500	6.0	7.5
US$7,500 and above	N/A	10

Source: Authors' construction using data from National Budget speeches

The overall taxation structure for minerals in Zambia does not differ much between copper and the non-copper minerals. However, there are some nuances with respect to the fixed rate of mineral royalty for instance copper has a sliding scale and the non-copper minerals have a fixed rate. It has also been indicated by several stakeholders that the tax regime for the non-copper minerals is stable relative to that of copper. As such, we would expect this scenario to attract more investment in the non-copper subsector and also drive diversification. However, this has not been the case and we discuss some of the contributing factors to this state of affairs in ensuing sections.

3. Mineral resources found in Zambia

Zambia's mining history dates back over a 100 years ago. This rich history is attributed to the fact that the country is endowed with a vast amount of mineral resources. Within its geographical confines, Zambia boasts of base metals, precious metals, industrial minerals, gemstones, and energy minerals. These mineral endowments are partly due to the country's geographical location[4]. We discuss in more detail the specific non-copper minerals in Zambia.

Gold

Gold deposits are mostly found in the Mwembeshi Zone and occurs in the zones near the base of the Katanga region with deposits of copper and uranium. More than 300 gold occurrences have been recorded in the county. A lot of districts are actively mining gold, these include: Solwezi; Mwinilunga; Kasempa; Mumbwa; Kabwe; Chisamba; Senga Hills; Mpika; Chilanga; Chadiza; Chirundu; Kazungula; Lundazi; Chongwe; Petauke; Lusangazi; Vubwi; Luano; Rufunsa; Chipata; Mkushi, etc[5] Gold is also mined at Kansanshi Mine in the North-Western province as a by-product.

Zinc and Lead

[4]https://www.zambia-mining.com/geology.html

[5] See https://www.zccm-ih.com.zm/2019/12/29/bank-of-zambia-to-buy-40000-kilos-of-gold-in-2020/

In Kabwe, zinc ore has been mined with around 11 metric tonnes of ore consisting of an average of 25% zinc and 15% of lead. Zinc has also been discovered in parts of the Copperbelt and in the western part of Zambia. Zinc occurrences are equally found in south eastern Zambia.[6]

Iron Ore

Deposits of iron ore have been discovered in central and western Zambia. Iron ore worth more than 900 metric tonnes has been estimated with these ores having more than 50% of iron content.. United Mining and Chemical Industries Limited (UMCIL) mines iron in Nampundwe's Sanje Hill area. More deposits are found in Mumbwa, Pamba hill and in almost every province in Zambia[7]

Diamonds

Some occurrences of diamonds are found in the Bangweulu area and possibly around the Kabompo area of North-western Zambia. These environments are favourable for alluvial diamonds[8].

Manganese

Currently, manganese small mining is done in Mansa, Luapula Province. Manganese deposits are also found around Northern Province and central Zambia broadening in the northward direction towards Mansa. Several small deposits have been found throughout the country which seem to be confined to acidic rocky areas. Processing is being done in Mkushi and Serenje. Manganese is used in the production of battery cells[9]. Manganese in Munali is mined by Mabiza Resources Ltd Zambia.

Nickel and Platinum

Nickel occurrences are found in the areas south and east of Lusaka. Nickel deposits are also found in the north-western region of Zambia. Furthermore, minor platinum group elements are produced as a by-product of copper refining on the major Copperbelt mines and from the Munali deposit.[10]

Uranium

Different substantial types of uranium deposits have been recorded in Zambia. It has often been argued that uranium usually accompanied by copper and gold deposits. Currently, exploration activities are taking place in southern Zambia as well as around the Siavonga area in the Gwembe valley.

Coal

Zambia boasts of extensive coal deposits and has been producing coal since 1967 from the Maamba mine near Lake Kariba in southern Zambia. Other coal deposits have been identified in the Gwembe area of the Luangwa and Luano-Lukusashi valleys and in the western province of Zambia.

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[6] ZDA. Zambia's Mining and Mineral Processing Profile

[7] http://www.daily-mail.co.zm/umcil-to-open-iron-ore-mine-in-october/
[8]See https://www.zambia-mining.com/exploration.html
[9] Nyambe. I and Phiri. C (2010). Database of Mineral Resources in Zambia
[10] Nyambe. I and Phiri. C (2010). Database of Mineral Resources in Zambia

Hydrocarbons

Historically, the country has had two major exploration programs by Mobil and Placid Oil undertaken between 1986 and 1991 within the Luangwa Rift Valley, one was terminated before intersecting the most favorable reservoir prospects[11]. Occurrence of hydrocarbons with oil generating potential are present within both the Luangwa and Mid-Zambezi Valleys. Recent exploration work for petroleum covering parts of North-Western, Western and Eastern Provinces of Zambia using the Microbial Prospecting for Oil and Gas technique indicated that the Okavango and North Luangwa basins have potential for oil and gas.

Gemstones

There is an increasing mindfulness of the value of Zambia's gemstones. Zambia's emeralds are sought after due to their deep green colour and the country's emerald deposits are among the world's largest; the gem is mined near Luanshya and Ndola and cut and polished locally. Amethyst which has a lower market value than other emeralds is abundant in Southern Province. Aquamarine and tourmaline are also gemstones that are mined in Zambia[12]. Grizzly Mining Limited mines emeralds in Ndola rural. Gemfields also mines emeralds in Lufwanyama under Kagem Mining Limited. These gemstones are sold on auction locally and abroad.

Apatite

Apatite, which is used in the manufacture of fertiliser is found in eastern Zambia.

Limestone and dolomite

Limestone and dolomite are plentiful in the Lusaka area, and these deposits, as well as others in the country's Southern, North Western, Northern, and Luapula provinces, have been recognized as ideal for cement and agricultural usage.

Clay Deposits

A large number of ball clay and brick clay deposits have been identified, although they have rarely been subjected to bench and firing testing. Large amounts of ball clay have been found in Shiwa Ng'andu in Mpika town in northern Zambia and Masuku in southern Zambia

Industrial Minerals

Zambia hosts cement deposits. Cement is being mined by Chilanga Cement in Chilanga, Dangote Cement and Sinoma Cement. Under industrial minerals Zambia has developmental minerals which are used in construction. These include dolomite and silica found around Lusaka, fluoride is found in Southern province.

4. Contribution of Mining to Zambia's Economy

The mining sector in Zambia can be segmented into two broad categories, that is, the copper mining sector which is dominated by multinational corporations, and the non-copper mining sector which has a mixture of big companies as well as artisanal and small-scale mining players.

While the sector is predominantly known for copper mining, the non-copper mining, artisanal and small-scale mining sub-sector has increasingly become a significant contributor to Zambia's economy. In 2020, the mining sector as a whole contributed around 79.5% to Zambia's exports and 31.4% towards the nation's total budget.

[11] ZDA. Zambia's mining and mineral processing profile
[12] https://www.britannica.com/place/Zambia/Resources-and-power

This makes mining a significant sector of the Zambian economy. Therefore, it is imperative to understand nuances of the sector, especially the non-copper sector which somewhat has for a long time been left out of the hawkish eye of the tax system due to its informal operations.

This section therefore, examines the extent to which the non-copper mining sector has been exploited vis-à-vis its contribution to the treasury of the country.

4.1 Extent of Exploitation of Non-Copper Mineral Resources (2019 – 2020)

As highlighted in earlier sections, Zambia has abundant mineral resources some of which remain unexploited. This can be attested from the Ministry of Mines data which shows that only 55% of the country has been mapped. This is concerning and an impediment to the prospects for mining diversification in the country.

Some of the country's mineral wealth is tabulated below with production volumes for the years 2019 and 2020 for selected non-copper minerals. While the data for 2019 and 2020 are captured here, the informality[13] that is imbedded in the sector may imply that some of the production volumes especially from artisanal and small-scale mining, mainly those involved in non-copper activities may not have been captured.

Table 2: Mining Sector Production Volumes 2019-2020

Commodity	Production volumes in 2019	Production volumes in 2020
Gold (Kilograms)	3,912.75	97,167.97
Emeralds(Kilograms)	23,704.61	9,783.43
Amethyst(Kilograms)	651,691	6,003,044
Nickel(tonnes)	2,499.64	5,712.03
Coal(tonnes)	361,647.80	448,821.40
Cobalt(tonnes)	367.28	287.19
Copper(tonnes)	787,698.77	837,996.38

Source: Ministry of Mines Data

The production volumes for some minerals such as Gold and Amethyst recorded significant leaps in 2020 as shown in the table. Upon further assessment, we were informed that this was a result of a change in compilation methodology. In 2020, the Ministry of Mines began to add export figures for these minerals to the production figures obtained from the ore processing plants.

4.2 Contribution to National Economy

The mining and quarrying sector as a whole contributes immensely to the country's economy. According to the 2020 Labour force Survey, the entire mining and quarrying sector, employs about 59,371 people representing 2% of the total employed persons (ZamStats, 2020). Of the 59,371, 30.7% are in informal employment. At the time of writing this memorandum, disaggregated data of labour between the non-copper mining and copper mining could not be accessed. It is intuitive to assert that a number of those informally employed are in the non-copper mining sector which is mainly characterized by informality.

[13] At the time of writing this memorandum, data on the extent of informality in the sector had not been obtained.

In addition to providing employment, the non-copper mining sector is a contributor to the country's forex basket. This can be seen from the attractive export values (for the non-copper mining products) estimated at 570 and 500 million dollars in 2019 and 2020 respectively, - this is equivalent to 2.5% and 2.7% of total GDP for the respective years[14]. Table 3 below shows estimates of the non-mining exports as a share of GDP for the years 2019 and 2020.

Table 3: Estimated Contribution of Non-Copper mining Exports to GDP (2018 - 2020)

Year:	**2019**	**2020**
Commodity	**Est Export value USD**	**Est Export value USD**
Copper	4,994,552,100	5,684,776,615
Non-Copper	569,291,317	501,214,499
Total Mining Export Value	**6,133,134,733**	**6,486,305,614**
Copper mining export % GDP	21.7	30.7
Total Non-copper export % GDP	2.5	2.7

Source: Author's Estimates from ZEITI and Bank of Zambia Annual Reports

In 2019 and 2020, the sector constituted 10.2% and 8.4% of the total mining exports respectively (See table 4 below). These statistics amplify the importance of the sector and present an opportunity for the country to diversify its mining investments to non-copper minerals. Given the informality that exists in the sector, it is reasonable to argue that formalization and empowering of the small scale miners would enhance mining diversification and improve revenues for the government.

[14] The export values were taken from the ZEITI 2019 and 2020 Annual Reports

Table 4: *Zambia's mining sector export estimates for (2018 – 2020)*

Year:	2018		2019		2020		2018	2019	2020
Commodity	**Export Volumes**	**Realised Prices**	**Export Volumes**	**Realised Prices**	**Export Volumes**	**Realised Prices**	**Est Export value**	**Est Export value**	**Est Export value**
Copper (US$/mt)	1,045,987	6,386	836,258	5,973	930,969	6,106	6,679,464,423	4,994,552,100	5,684,776,615
Cobalt (US$/mt)	1,766	67,382	1,271	33,576	367	28,946	119,010,088	42,684,787	10,620,104
Gold (US$/ounce)	126,064	1,174	138,135	1,422	123,157	1,794	147,986,530	196,386,530	220,894,395
Gemstones(kg)	-	-		-	-	-	-	149,500,000	68,800,000
Manganese Ores(mt)	-	-	87,182	-	-	-	-	11,920,000	9,900,000
Cement and Lime(mt)	-	-		-	-	-	-	168,800,000	191,000,000
Total							**6,946,461,041**	**5,563,843,416**	**5,985,091,114**
Total non-copper Export (2019 - 2020)								**569,291,317**	**501,214,499**
Percentage of mining exports (Gold)								3.53	3.69
Percentage of Mining Exports (Copper)								89.77	94.98
Total non-copper % of Mining Export								**10.2**	**8.4**

Source: Bank of Zambia and ZEITI Annual Reports

5. Suitability of the investment climate for the non-copper mining subsector

From a regulatory perspective, the Zambia Development Agency Act provides incentives for companies investing substantial amounts in the mining sector in the country. The mining sector is identified among the priority sectors in the country. This is not different from the investment regime in other sectors of the economy.

The Zambia Development Agency Act of 2006 (with subsequent amendments) offers a wide range of incentives in the form of allowances, exemptions and concessions for companies. The Act provides for investment thresholds to qualify for fiscal and non-fiscal incentives. Investors who invest more than US$500, 000 and above in a Multi Facility Economic Zone, an industrial Park, a priority sector and investment in a rural enterprise are entitled to the following incentives:

(i) Zero percent import duty rate on capital equipment and machinery including trucks and specialized motor vehicles for five years.

(ii) Accelerated depreciation on capital equipment and machinery including trucks and specialized motor vehicles for five years.

For investments that are of not less than US$250,000 in a Multi Facility Economic Zone, an Industrial Park, a Priority Sector and investment in a Rural Enterprise under the ZDA Act, the ZDA Act provides for the following non-fiscal incentives:

(i) Investment guarantees and protection against state nationalization;

(ii) Free facilitation for application of immigration permits, secondary licenses, land acquisition and utilities

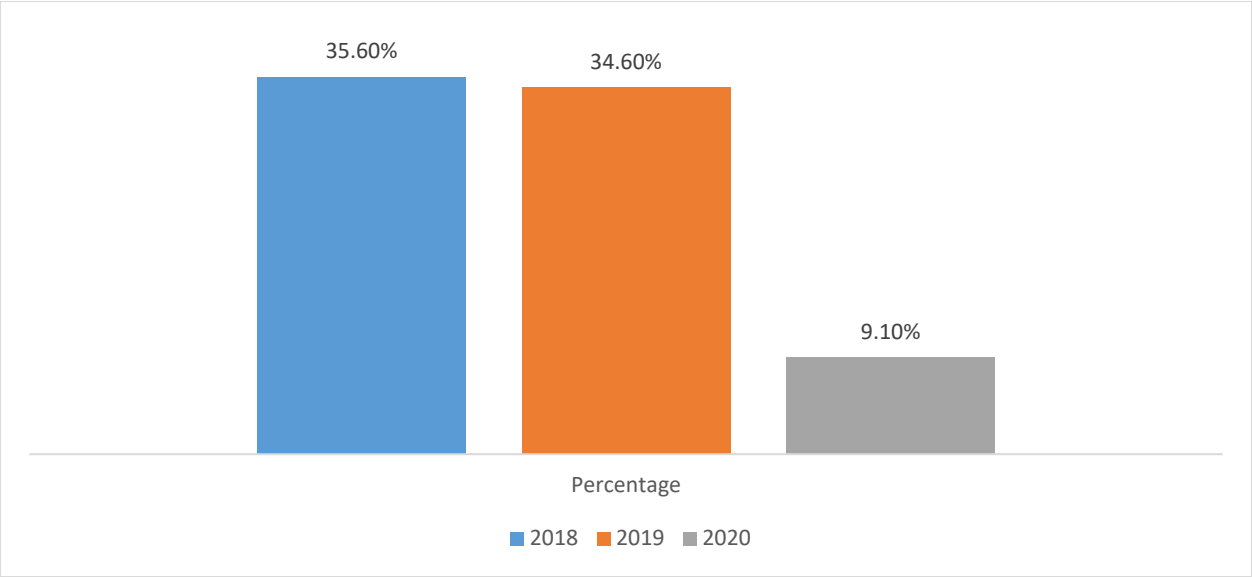
Notably, the Government recently reduced the investment threshold for local investors from US$500, 000 to US$50, 000 which should ideally facilitate more investments by local firms.

In terms of the suitability of these incentives for the non-copper mining sector, there is obviously some form of relief provided to investors in the sector. The firms are therefore provided a platform to recoup on their huge investment outlays. The recent amendment to provide a differentiated threshold for local investors also enable small scale and artisanal miners, most of whom are engaged in non-copper mining to make investments in the sector. We are also cognisant of an array of literature that has shown that investment incentives alone are not the panacea to the growth of the non- copper mining sector. As we argue later in this chapter, a combination of measures that address the cost of doing business, access to electricity, poor infrastructure and also access to cheap and affordable finance are needed to facilitate investment in the sector.

The amount of actualised investment recorded in the mining sector as indicated in ZDA annual reports averaged 35% in 2018 and 2019 before drastically dipping to 9.1% in 2020[15] (See Figure 1).

[15] This reduction was in keeping with the overall reduction in actualised investment which was partly attributed to limited monitoring and evaluation undertaken by the ZDA due to the outbreak of the COVID-19 pandemic which restricted movement of staff in industry.

Figure 1: Actualised investment in the mining sector (2018 - 2020)

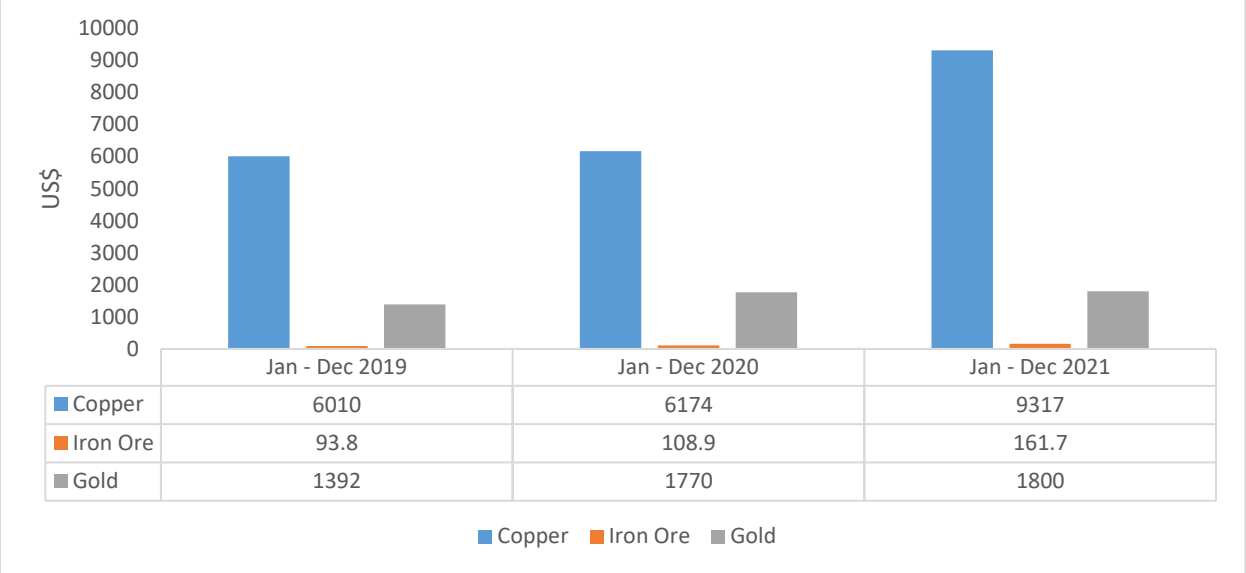


Source: Authors' construction from ZDA annual reports

The investment fluctuations recorded in the mining sector are indicative of inherent challenges with respect to the investment climate in the sector. By nature, mining is a long-term investment that thrives on the availability of detailed information. As such, investors always seek to de-risk their investments by having as much information as possible usually obtained through exploration and mapping. Geological mapping and exploration is therefore important in providing valuable information regarding the return on investment. For the non-copper mining sector in Zambia, one of the challenges affecting investment is the limited amount of information resulting from inadequate exploration and mapping. As highlighted earlier, only 55% of the country has been mapped.

Investment is also affected by the projected price of minerals. Generally, the price of non-copper minerals is not as high as that of copper as shown in Figure 2 for selected minerals. Further, due to the occurrence in scanty quantities, investment in exploration remains unattractive. This lack of detailed exploration leads to less investment resulting from limited information.

Figure 2: Average International Prices for selected minerals



Source: Authors' construction from World Bank data

On the positive side, the non-copper subsector has a much simpler tax regime compared to copper and uses a fixed rate for Mineral royalty. Ordinarily, this should attract more investment given the stable and predictable nature of the fiscal regime for the subsector.

The Government has, in recent years, tried to promote investment in value addition activities in the non-copper subsector. In terms of encouraging investment, there are some deliberate policies such as the levy on the export of unprocessed minerals like in the manganese sub-sector. In doing so, mining firms are discouraged from exporting raw minerals thereby setting up processing plants and increasing beneficiation. However, value addition requires holistic efforts that go beyond levies on the export of unprocessed minerals. The general cost of doing business, reliable energy supply, adequate infrastructure and also financing should all be addressed tandem with such policies as levies.

The investment climate for the non-mining subsector is broadly within the realm of the ZDA Act which provides for incentives in line with the investment thresholds. However, there are some challenges that continue to discourage investment such as limited information arising from low levels of mapping and exploration. There are also some factors that should ordinarily attract investment such as a stable fiscal regime in the sector.

6. Opportunities available in the non-copper mining sub-sector

The non-copper mining sector in Zambia is wrought with vast opportunities that if exploited could lead to a positive impact on the country's economy through job creation, increased tax revenue and exports, among others. Some of the notable opportunities identified from our key informant interviews and also review of literature are highlighted below:

Increased demand for minerals in clean energy technologies

The negative effect of climate change has brought about the need to transition to cleaner sources of energy. Cleaner energy technologies such as electric vehicles, battery storage, solar panel, etc., require a wide range of minerals and metals in varying quantities. An assessment by the International Energy Agency (IEA) showed

that combined efforts to reach the Paris Agreement which is climate stabilisation at "well below 2°C global temperature rise" would entail quadrupling of mineral resource needs for clean energy technologies by 2040[16]. Reaching the net-zero target by 2050 would require six times more mineral inputs in 2040 than today. This growing demand for minerals such as cobalt, lead, nickel and zinc gives Zambia an opportunity to increase mining of these minerals.

Increased demand for gemstones

There is also an opportunity for Zambia to grow its gemstone mining industry. A report written in 2020 by the Expert Market Research (EMR)[17] indicated that the global gemstone market is expected to grow at a compound annual growth rate of 4.8% for the forecast period 2022 to 2027. The major markets are Africa, North America, Latin America, the Middle East, Asia Pacific and Europe. The report also highlighted that the growing demand for gemstones is driven by rising consumer incomes and standards of living especially in emerging nations. The rising demand for coloured gemstones is also contributing to the industry growth. This presents Zambia with an opportunity to increase gemstone mining as well as gemstone cutting and polishing.

Relatively low operation costs for gold panning

Another opportunity for Zambia in the non-copper subsector is gold panning which is mainly undertaken on riverbeds. The equipment used in gold panning is not too costly, some of this equipment includes gold detectors, shaking tables and sluice boxes. The relatively cheaper equipment makes it possible for artisanal mining participation. Cooperatives have also been set up and panning certificates or artisanal mining rights are given. Some of these cooperatives are found in Vubwi, Lusangazi and Lumezi. This is a good initiative in that it reduces illegal mining and increase the government's revenue sources. The manganese industry presents opportunities that can be exploited. Further exploration of unmapped areas could lead to the discovery of more non-copper minerals. There are gold deposits that haven't been explored and would provide significant sources of revenue.

Refining of manganese

Manganese is currently being sold as silicomanganese or ferromanganese which is not a finished product. There exists an opportunity to build manganese refineries so that manganese can be sold and exported as pure manganese after being refined locally[18].

Increased demand for dimension stones in the construction industry

There is also high potential for increased mining of dimension stones[19] due to the boom in the construction industry. An example of dimension stones found are Zambezi stones which are found in Siavonga with most mining currently being done by locals.

[16] IEA (2021), The Role of Critical Minerals in Clean Energy Transitions, IEA, Paris https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions

[17] https://www.expertmarketresearch.com/reports/gemstones-market

[18] Interview with key stakeholders.

[19] A dimension stone is natural stone or rock that has been picked and completed (e.g., trimmed, cut, drilled, ground, or otherwise) to precise sizes or forms.

Exploration potential for diamonds

Zambia's abundance of diamonds and indicator minerals demonstrates the country's significant exploration potential[20].

Exploration potential for Emeralds

Exploration of the Ndola Rural region utilizing a mix of soil geochemistry and radiometric surveys, as well as precise mapping, has the potential to find new deposits of high-quality jewels. Eastern Zambia has a lot of Lufilian (Pan-African) pegmatite bodies, therefore more aquamarine and tourmaline finds are probable. Amethyst is abundant in Lake Kariba in southern Zambia, and exploration should concentrate on late-Karoo and post-Karoo fault zones[21].

7. Challenges faced by the non-copper mining operators

Based on key informant interviews that we undertook with various stakeholders in the sector, we found that operators in the non-copper mining sub-sector face a number of challenges as outlined below:

(i) **Lack of geological information**: This continues to undermine the planning process of the non-copper mining sector to attain nation-wide development. Currently, only about 55 percent of the country has been mapped and this is attributed to lack of funding at the Ministry of Mines. The lack of geological information has inhibited efforts to diversify the mining sector into other mineral commodities such as gemstones, industrial minerals, manganese, and gold. It is important to stress the fact that not only does geological information help with the planning process but it also encourages long term investment in the mining sector.

(ii) **Lack of transparency on the national geological survey and the award of exploration licenses:** There is little information about mineral potential to engender citizen participation in artisanal mineral exploration and mining. Part IV of the principle Act which gives excessive power to holders of exploration and mining rights takes away economic freedom from citizens holding surface rights who under ideal situations should be shareholders or be given the first priority to undertake exploration and mining. In short, no surface rights holders should be given mineralisation information of the land they occupy and ultimatums to apply and utilise their exploration licenses and the foreign interest should only be considered if the locals are unable to use those rights. This will also help with accountability and curbing of illegal mining.

(iii) **Illegal mining activities**: Illegal mining activities continue to pose a challenge to the growth of the non-copper mining subsector. For instance, Manganese is one such mineral that has attracted high levels of illegal mining and it is highly prevalent in Luapula province. Villagers conduct these illegal activities with no regard of who has a mining or exploration license in the area. This poses a challenge to the private sector engaged in legal mining activities as the community moves into the mine areas victimising legal owners of mining and exploration licenses. The onus is on the owner of the license to ensure that there are no illegals and this is not the case. This particular mineral is attractive because there is a ready market for manganese which is used in the production of electric car batteries.

(iv) **Lack of domestic market for unprocessed minerals**: The Government has put up deliberate policies aimed at promoting value addition locally. One such measure is the levy on the export of

[20] See https://www.zambia-mining.com/exploration.html
[21] See https://www.zambia-mining.com/exploration.html

unprocessed minerals to try and discourage export of raw minerals. While this move is progressive as it promotes beneficiation, the unintended consequence is that some mining houses have found this to be a challenge especially those whose materials cannot be taken by the local market. Since some of these firms have not invested in processing capacity, they struggle to find markets for their products.

(v) **High cost of licenses charged by local authorities for exploration**: While the Ministry of Mines issues underground mining rights, the surface rights are vested in chiefs and the Ministry of lands. As such, mining firms have to apply for surface rights from the Ministry of Lands and the traditional authorities. In the process, some local authorities tend to charge mining firms huge sums of money from exploration licenses. It must be noted that at this stage, the mines are not making any money and yet they are charged a lot of money by local authorities and this becomes a barrier to entry.

(vi) **Conflicts between local communities and mining firms:** Another challenge faced by operators in the non-copper mining sub-sector is that of conflicts with local communities. This happens where local communities do not accept the license owner and feel entitled to the land and minerals therein. The communities often feel that they are unfairly treated despite the normal procedure in accessing mining rights being followed by the mining firms. This often poses a security challenge in the operations of the firms.

(vii) **Lack of capacity among artisanal miners**: Another challenge relates to the underdeveloped Artisanal and Small-scale Mining (ASM) sector. The ASM sector is currently being faced with several challenges including lack of access to finance, lack of geological information, lack of basic technology in the mining process, and high tax rates. These challenges have inhibited growth of this important sector which continues to be perceived as an alternative livelihood for those that cannot get jobs in the formal sector. It must be noted that most artisanal miners are engaged in non-copper minerals.

8. Impediments to growing the non-copper mining sub-sectors' contribution to the economy

From the perspective of potential investors in the sector, there are some impediments to growing the sub-sectors" contribution to the economy as follows:

(i) **Information barrier:** There is lack of information on non-copper mining resources and reserves. This has arisen from the Ministry's inability to undertake mapping. Potential mining houses have equally not done enough exploration which could woo other investors.

(ii) **Huge investment costs**: Generally, mining involves heavy investment outlays. This poses a challenge especially in the absence of adequate information on exploration and mapping. For instance, green field projects start from scratch and will involve a lot of financial outlay.

(iii) **Presence of speculative license holders**: The non-copper mining subsector is wrought with numerous holders of speculative licenses arising from the provisions in the principal Act which allows license holders to only cede 50% of their license area at the point of renewal. These licensees merely procure exploration and mining licenses for speculative purposes yet they do not undertake any exploration or mining activities. This inhibits the growth of the subsector.

(iv) **Limited offering of intermediate mining courses:** The limited offering of courses such as geology, surveying, mining engineering etc. creates a significant skills shortage. Most mining courses are offered at the minimum of degree. As a result, most artisanal miners lack specialised training in mining.

9. Strategies that should be put in place to enhance the contribution of the non-copper subsector to the economy.

To enhance the sub-sectors' contribution to the economy, the following measures should be put in place:

(i) **Increase funding to support geological mapping**: The Government must increase funding allocation to the Ministry of Mines to support mapping activities. Through this activity, the occurrence of minerals in certain areas could be discovered. The whole country needs to be mapped since exploration depends on mapping and investors look for geological reports in particular area. The Government could partner with sister institutions in developed countries to undertake this activity. For instance, the Namibian Government recently partnered with the German Geological Survey and undertook a mapping activity for the entire country.

(ii) **Formalise the Artisanal Small Scale Mining sector**: The Government must support the Artisanal Small Scale mining sector which forms a large component of the non-copper mining sub-sector. This can be done through the provision of an enabling environment for basic services and facilities such as finance, technology, geological information among others. Proper market development activities can help link artisanal miners to financial markets.

(iii) **Address the high prevalence of speculative licenses**: There is need for a deliberate move to bring all speculative license holders to the table and revoke their licenses as provided for in the law which gives a duration of non-performing licenses who should provide convincing reasons to defend their position. The areas can then be blocked so that the next time they are opened up should be for serious investors.

(iv) **Curb illegal mining**: The Government must enhance security operations and monitoring in areas that are rife with illegal mining. While the onus to protect mining areas is on the license holders, most of these companies appear overwhelmed with illegal mining activities. As such, the Government must step in and enhance security especially in the far-flung areas to curb illegal mining. The Government can also undertake sensitization programmes to educate local communities on the dangers of illegal mining and the losses that Government incurs in terms of forgone revenues.