ZIPAR
Zambia Institute for Policy Analysis & Research

Investment Brief
No. 4 | October 2015

# Mining Sector

**INDUSTRY FACT FILE**

| | |
|---|---|
| **Mining sector growth (2014):** | -6.9% |
| **Mining sector share of GDP (2014):** | 9.2% |
| **Mining share of FDI inflows (2013):** | 65.5% |
| **Return on Equity of FDI in Mining (2013):** | 3.5% |
| **Number of employed persons in Mining (2012):** | 88,251 |
| **Avg. number of employees per mine (2012):** | 1,192 |
| **Informal share of employed persons (2012):** | 23.4% |
| **Female share of employed persons (2012):** | 14.1% |
| **Mining sector share of Labour Force (2012)**: | 1.5 % |
| **Average wages in Industry (2012):** | K4, 655 {$ 895} |
| **Copper Prices (2014):** | $6,482/mt |
| **Share of total exports (2014):** | 75.2% |
| **Major export markets (2014):** | Switzerland, China, Congo DR, Singapore, South Africa |
| **Mineral Occurrences in Zambia:-** | |
| ***Precious Metals***: | Gold, Platinum |
| ***Base Metals & Minerals:*** | Copper, Cobalt, Zinc, Lead, Iron Ore, Manganese, Nickel |
| ***Gemstones:*** | Emeralds, Diamonds, Aquamarine, Tourmaline and Amethyst |
| ***Energy Minerals:*** | Uranium, Coal, Oil & gas and Hydrocarbons |

## Brief Overview

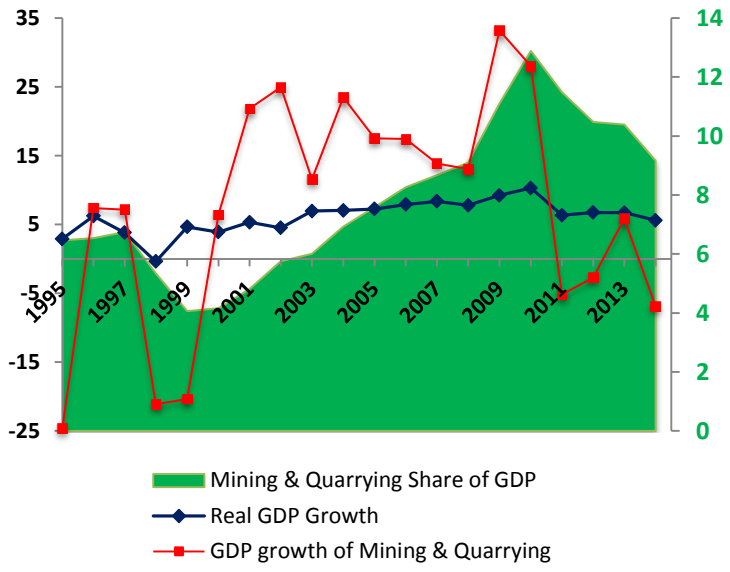
This Investment Brief presents a profile of the Mining sector in Zambia which is defined as mining activities covering all minerals in Zambia. The objective of the brief is to provide quick insights on the mining sector, the existing investment opportunities as well as the weaknesses and threats facing the industry.

## Evolution of the Mining Sector

***Performance of the Mining Sector***

Zambia's economic growth has for many years been fuelled by developments in the mining sector and until recently, China's demand for commodities and rising commodity prices. On average, output in the mining sector grew at rate of 7.8% per annum over the last 20 years. The sector's growth was particularly impressive in 2009 at 33.2% fostered by the surge in copper production which was triggered by the entry of Lumwana Copper Mine onto the local scene. Growth was sustained in 2010 albeit at a lower rate. In 2011 however, the sector contracted sharply by 5.2 owing to inadequate electricity supply to the industry among other challenges. More recently in 2014, the sector recorded a negative growth rate of -6.9% attributed to a number of factors among them operational challenges and maintenance shutdowns at some mines and low grade ore and accumulated concentrates.

**Figure 1: Real growth rate of the Mining Sector, 1995-2014 (%)**




*Graph Based on Central Statistical Office Data*

Output is expected to be even lower in 2015 owing to lower copper demand and prices and poor electricity supply. By end-August 2015, copper production was estimated at 441,584 metric tonnes against an annual

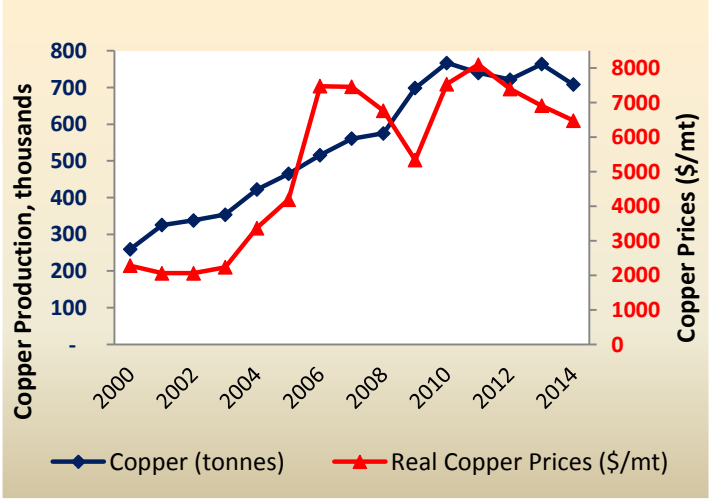

For comments and/or questions, please contact the Executive Director, Zambia Institute for Policy Analysis and Research, P.O. Box 50782, CSO Annex Building, Corner of John Mbita and Nationalist roads, Ridgeway, Lusaka; email: info@zipar.gov.zm, Tel: 260 211 252 559

target of 808,000 metric tonnes[1]. This performance indicates that copper production will fall short of the envisaged target. The overall contribution of the sector to GDP has been low over the last two decades – averaging less than a tenth of total GDP each year. The sector's contribution breached the 10% mark in the year 2010 when international copper prices were on the rise. Conversely in 1999, the sector's share of GDP shrunk considerably to 4.1%, a year during which copper prices were at their lowest at about $1,951.65 per metric tonne.

***Copper Production***

Zambia is one of the world's largest producers of copper ranked 8th in the year 2014. Copper remains the country's principal mineral output and main source of foreign exchange accounting for 75.2% of total exports in 2014. Copper production has increased over the years from approximately 259,573 tonnes in 2000 to 708,259 tonnes in 2014 (Figure 3), representing an increase of about 173% between the years. This has largely been due to the continued rise in mineral output over the years aided by the sustained rise in international metal prices.

**Figure 3: Zambia's Annual Copper Production and Prices 2000-2014**



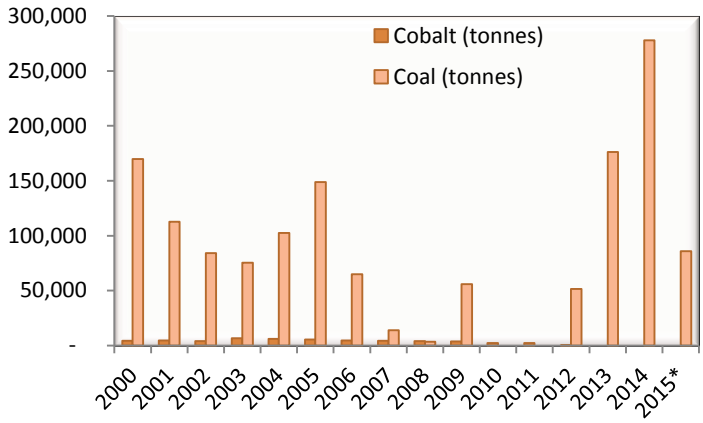

*Plot based on CSO*

Other factors accounting for the growth over these years has been improvements in production techniques, expansion of various mining operations, increased capacity utilisation and commencement of operations by various mines. The sector has however met with both international and domestic challenges in 2015 which are expected to negatively affect production. Internationally, the challenges emanate from China's sluggish demand for copper and consequently low international copper prices. On the domestic front, the current power deficit has hampered the operations of a number of mining firms. The country is expected to record copper production of 741,916 metric tonnes against an initial target of 808,000 metric tonnes in 2015.

***Other Mineral Production***

Cobalt, a by-product of copper is a supplementary mineral produced in Zambia whose output has however been declining over the years (figure 4). In fact from 2013, mining firms did not report any cobalt production at all. Other minerals extracted intermittently include coal and nickel. Zambia also excavates precious metals and semi-precious stones namely gold and gemstones albeit in relatively smaller quantities compared to copper.

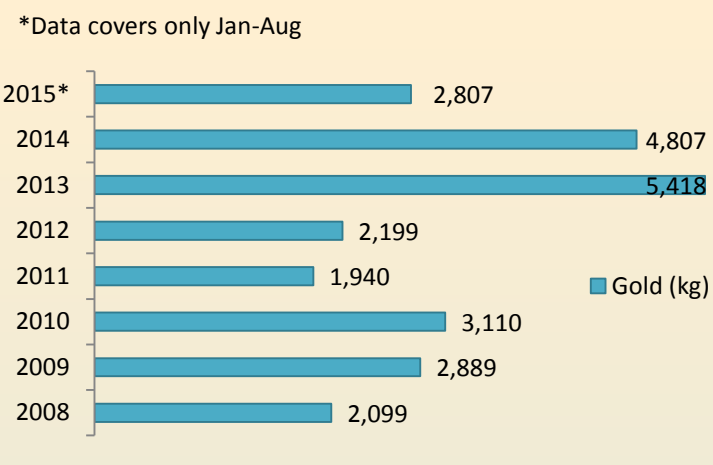
**Figure 4: Cobalt and Coal Production 2000-2014**




*Source: CSO data*

According to the Memoir on the Geology and Mineral Occurrences in Zambia, Zambia has been a small producer of gold as a by-product of copper refining. The country was also previously been a small producer of gold from a number of small mines. The largest recorded historical production is from the Dunrobin gold project that is estimated to have produced 990kg of gold. Others include Matala - 225kg in the Mumbwa area; Jessie - 390kg in the Rufunsa area; and Sasare - 390kg in eastern Zambia[2].

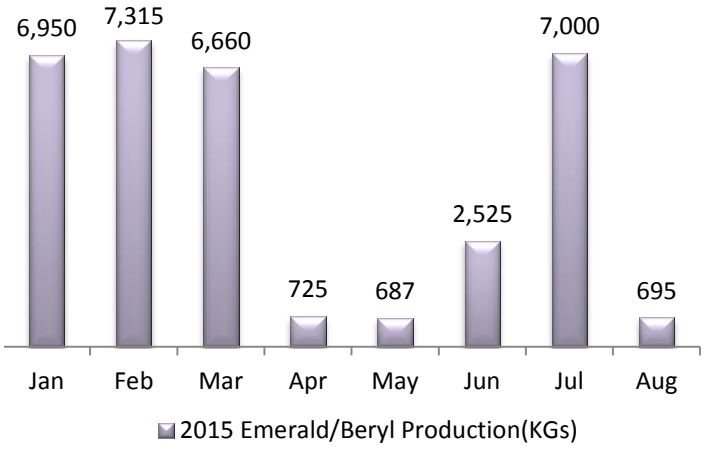
**Figure 5: Gold Production 2008-2015**




*Source: CSO data*

Available data on the total production of gemstones for the year 2015 shows that production of Emerald and Berly stones has been very volatile over the period January to August. While production was in excess of 6,000kgs in the first quarter of the year and in the month of July, production fell drastically in the second quarter of the year as well as in the month of August (figure 6). However, it should be noted that statistics on the production and export of gemstones are poorly documented. Further, it is widely acknowledged that most gemstone mining is carried out by small scale artisanal miners, often illegitimately.

**Figure 6: Emerald/Beryl Production (KGs), 2015**

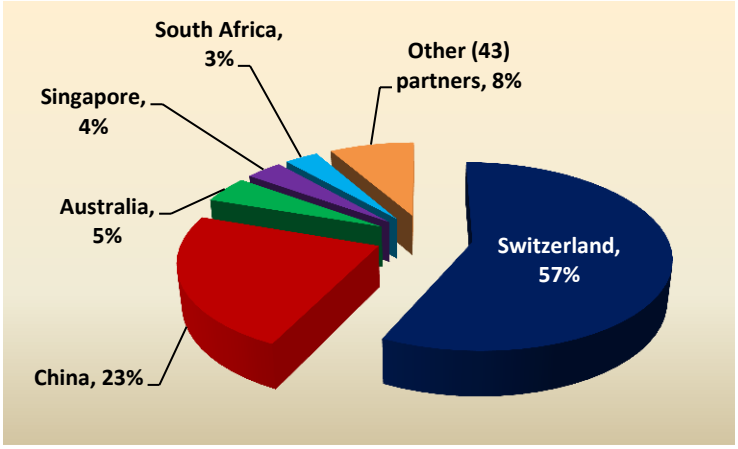



*Source: CSO data*

***Mineral Exports and Markets***

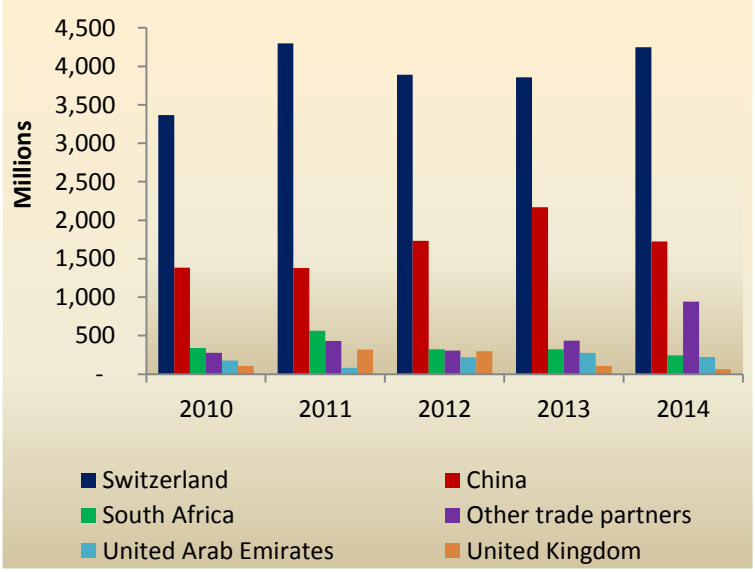
Switzerland is Zambia's reported major export destination for metal exports accounting for 57% of all Zambia's copper exports in 2014. The second largest reported export market destination for Zambia's copper production is China accounting for 23%. Other key markets include Congo DR, Singapore, Australia and South Africa.

**Figure 7: Major Metal Export Destinations (Share of Exports' Value) – 2014**




*Source: World Bank World Integrated Trade Solution Data*

**Figure 8: Major Metal Export Destinations 2014-2010 ($)**

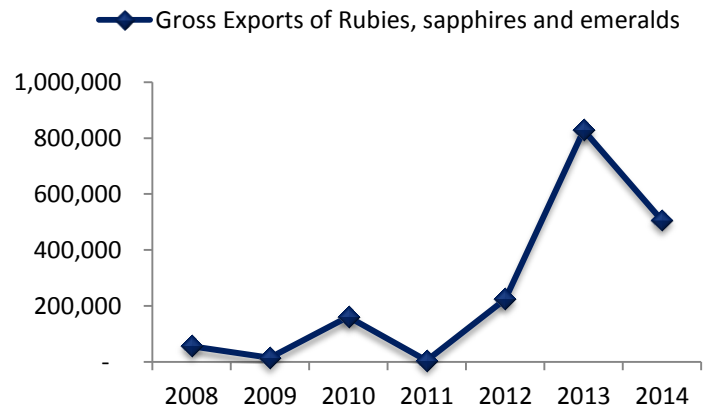



*Source: World Bank World Integrated Trade Solution Data*

The official final destination of the largest share of Zambia's copper exports – Switzerland – came under question in 2015 largely because copper is not a product for which there is particular significant demand in Switzerland and because there are no corresponding mirror records showing that Switzerland imported any copper products from Zambia.

The final market destination of the largest share of Zambia's copper exports remains indeterminate but global demand for copper suggests China is the final destination. In addition to copper, Zambia export of various gemstones has been increasing over the years.

**Figure 9: Exports of Gemstones 2008 – 2014 ($ value)**



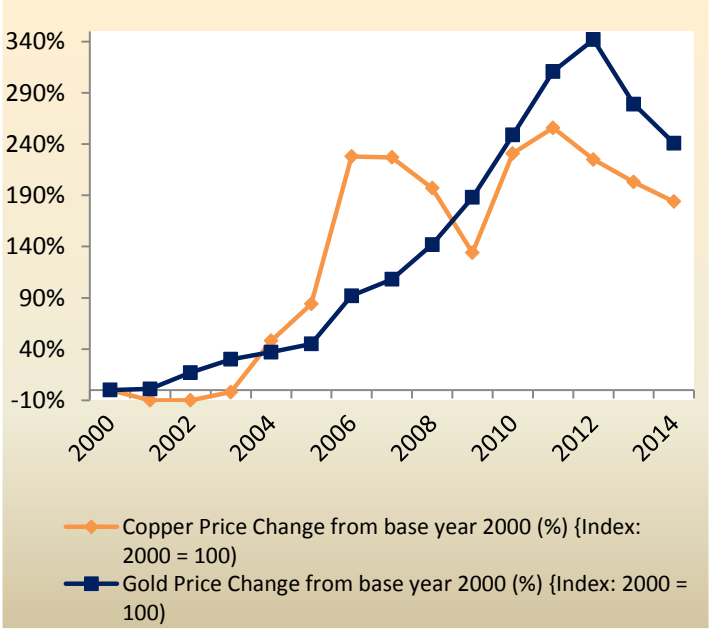

*Source: World Bank World Integrated Trade Solution Data*

***The Commodity Price Boom***

Commodities in the 2000s experienced a price boom stimulated by demand for commodity groups by emerging markets namely China, India and the Middle East. Factors contributing to this boom included annual increases in global consumption of major commodities reinforced by per capita income growth, rapid industrialization, higher commodity intensity of growth, and rapid population growth in major emerging economies[3].

This boom however was momentary. Commodity prices plummeted during the global financial crisis but soon rebounded in 2011 owing to increased industrial production in China. During this year, copper prices reached a record high of $ 8,104 per metric tonne. Since then, commodity prices have taken a dip following the slowdown in China's growth. Copper prices are estimated to have fallen from an average of US $6,829 per metric tonne in 2014 to US $5,160 per metric tonne in 2015.

Figure 10: Annul Real Copper & Gold Price Change 2000-2014

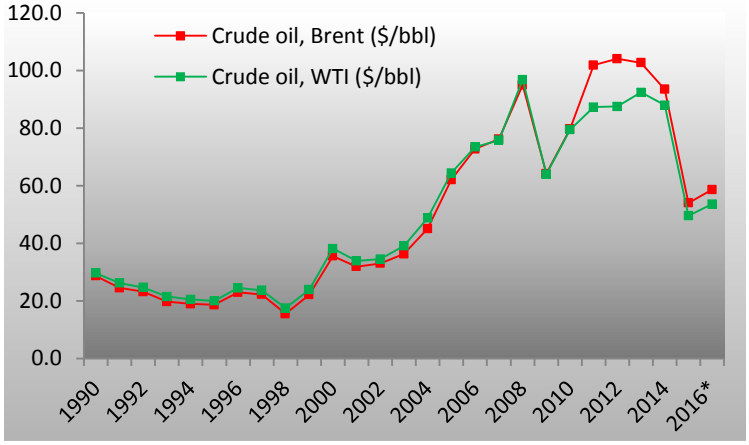



*Source: Plot based on World Bank data*

Oil prices equally plummeted to unparalleled levels in 2015 as result of increased global supply of oil from the US Shale producing companies and the traditional OPEC countries. By August 2015, Brent crude had declined below $45 per barrel while the West Texas Intermediate (WTI) crude came down below $40 – a staggering 60 decline in crude oil prices since August 2014. The US Energy Information Administration (EIA) projects Brent crude oil price to average $54/b in 2015 and $59/b in 2016. WTI crude oil prices are expected to average $4/b lower than the Brent price in 2015 and $5/b lower in 2016. These price developments have implications for prospectors who have been granted exploration rights for oil and gas mainly in the Western, Southern and Northern provinces.

The EIA anticipates that during the price discovery period, oil prices could continue to experience periods of heightened volatility as the oil continues to face many uncertainties heading into 2016. Uncertainties include the pace and volume at which Iranian oil re-enters the oil market; the strength of oil consumption growth; and the responsiveness of non-OPEC production to low oil prices.

Figure 11: Annul Crude Oil Prices 1990-2016




*Source: World Bank and US EIA data*

***Growth Prospects for the Mining Sector***

The sector has been confronted by both domestic and external shocks that pose threats to the sector's growth prospects. On the international scene, the sector faces commodity prices shocks arising from sluggish growth and demand for commodities in China. With China's growth strategy to shift from an industry-led to a service-oriented economy and oversupply of commodities, demand for commodities, particularly copper and oil may not rebound soon.

Domestic challenges facing the sector include reduced power supply to the industry and Government's policy inconsistency on the taxation of the mining industry. In addition, the intention by Glencore to suspend production at Mopani and Katanga mines in Zambia and the DRC respectively is likely contract the growth of the sector. This suspension comes as a result of high output costs which

the mining company envisages to reduce by expanding and upgrading projects. Notwithstanding the current challenges, copper output is projected to increase by nearly 24% by the year 2018 as a result of increased output from Kansanshi Mine and the operationalisation of Konkola Deep Mining Project[4].

## Strengths, Weaknesses, Opportunities and Threats in the Mining Sector

## STRENGTHS

***Diverse Mineral Occurrences in Zambia***

Memoir 6 on the Geology and Mineral Resources in Zambia shows that over 80% of Zambia has been mapped. Regional mapping is carried out at 1:50,000 scale and published at 1:100, 000 scale as quarter degree sheets supplemented with a report. The Memoir estimates that there are 260 quarter degree sheets, 60% of which cover the Kalahari of Western Zambia. Further, an estimated 100 sheets have been published and over 60% of solid geology has been mapped at 1:100,000 scale which is said to provide an excellent base for exploration.

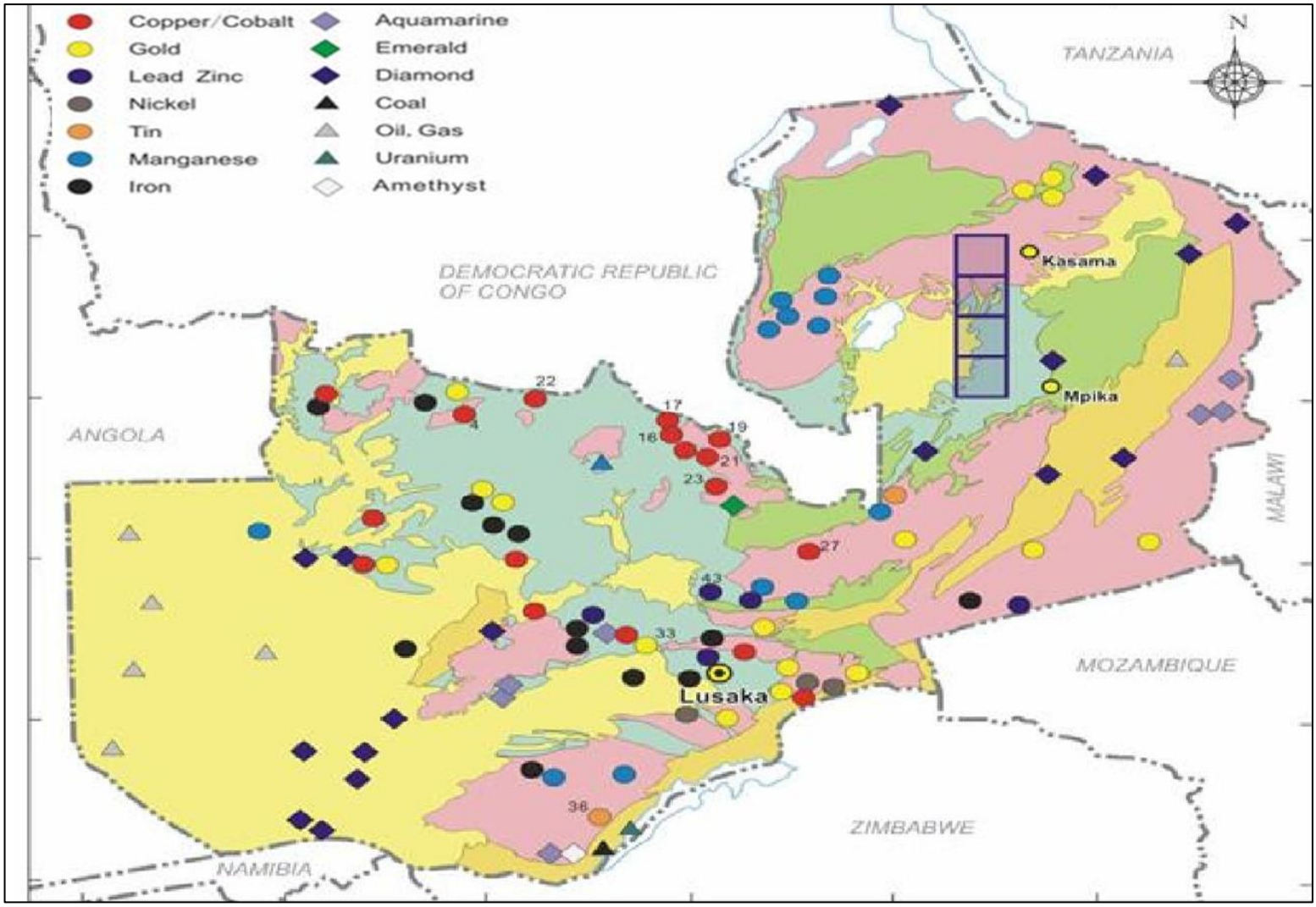
Zambia is reported to comprise a number of geologically diverse terrains that range from stable Archaean and early Proterozoic cratons to structurally complex 'mobile belts' and younger cover rocks. This diverse terrain creates considerable exploration potential of the country. The modified geological and occurrence map (figure 12) shows that Zambia has great mineral potential in various geological environments that remain largely unexploited. The country boasts of large deposits of copper, cobalt, and potential for iron, zinc, manganese; industrial minerals such as limestone, dolomite, phosphates, clays etc.; energy minerals namely uranium, coal and oil; and precious stones such emeralds, amethyst, aquamarine, gold and diamonds; among others.

**Table 1: Summary of Mineral Occurrences in Zambia**

| Base Metals | Precious Metals | Gemstones | Industrial Minerals | Energy Minerals |
|---|---|---|---|---|
| Copper | Gold | Emeralds | Limestone | Uranium |
| Zinc | Silver | Amethyst | Dolomite | Coal |
| Nickel | Diamonds | Aquamarine | Phosphates | Hydro-carbons |
| Tin | | Red Garnets | Clays | Oil & gas |
| Cobalt | | Tourmalines | Talc | |
| Iron | | | Feldspar | |
| Manganese | | | | |

In actual fact, the country has the second largest deposit of the world's finest emeralds comprising 20 per cent of the world supply[5]. Zambia's emeralds are also highly sought as a result of their intense green colour which commands high prices on international gem markets. Besides gemstones, it is estimated that more than 300 gold occurrences, mostly prospects, have been recorded in Zambia[6]. Further, the country is also reported to have deposits of alluvial diamonds in most parts of north-eastern and western Zambia.

**Figure 12: Modified Geological and Mineral Occurrence Map 1: 2, 000, 000 (1994)**




*Source: Banda, F. (2015)*

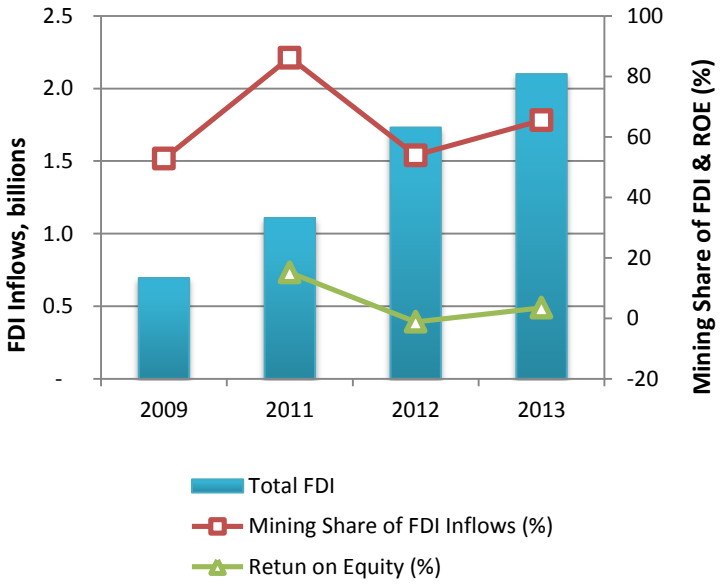
***Growing Foreign Direct Investment in the Mining Sector***

Zambia continues to record a steady increase in Foreign Direct Investments (FDI) inflows. Overall FDI inflows increased to USD 2.1 billion in 2013 from USD 1.7 billion recorded in 2012 with Mining and Quarrying accounting for more than half of Zambia total FDI inflows. In 2013, the sector continued to dominate FDI inflows at 65.5%.

Returns on these investments have been positive albeit very low with the exception of the year 2011 and 2012. In 2011, investments in the mining sector attained their greatest return at 15.1%. This period coincides with the year during which copper prices soared to their record

high. On the contrary, investments in the sector took a negative turn in the subsequent year. The sector was estimated to have recorded a negative Return on Equity of -1.2% indicating that shareholders made losses on investments for the said year. Factors that could account for this loss include lower international copper prices and reduced mining output in 2012.

**Figure 13: FDI Inflows and Return on Equity in Mining & Quarrying 2009-2013**




*Source: Foreign Private Investment & Investor Perceptions in Zambia – 2019-2014*

***Government support (fiscal and non-fiscal incentives)***

Fostering increased value addition to commodities and synergies between the mining and manufacturing industries is one of Government's key objectives for industrial development. In this vein, Government offers generous fiscal and non-fiscal incentives to investors who invest not less than $500, 000 in a Multi Facility Economic Zone, an Industrial Park, a Priority Sector and a Rural Enterprise. For instance, auxiliary investments in copper smelting, manufacture of copper cables, cutting and polishing of precious stones etc. that fulfil the aforementioned conditions would be entitled to the following incentives:

**FISCAL INCENTIVES:**

i. ***Zero% tax rate on dividends for 5 years from year of first declaration of dividends;***
ii. ***Zero% tax on profits for 5 years from the first year of operation; and***
iii. ***Zero% import duty rate on capital goods, machinery including specialized motor vehicles for five years.***

**NON- FISCAL INCENTIVES:**

i. ***Investment guarantees and protection against state nationalization; and***
ii. ***Free facilitation for application of immigration permits, secondary licenses, land acquisition and utilities***

## WEAKNESSES

***High Production Costs***

Mining production costs are reportedly high and driven by high input costs and low productivity[7]. Inputs driving the high cost of production include labour costs, capital expenditures on equipment and spare parts, expenditures on fuel and other consumables. Of these, the major reported input cost of concern is labour which has risen in recent years but without a corresponding increase in productivity[8]. ZIPAR analysis on labour productivity corroborates this assertion. Labour productivity in the mining and quarrying sector decreased in the years 2011 and 2012. The labour Force Survey data also shows that the sector offers the third highest average monthly compensation estimated at K K4,655 (US$ 895) in 2012.

Table 2: Mining and Quarrying Selected Labour Indicators

| Mining and Quarrying Selected Labour Indicators | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Labour Productivity Growth | 35.50% | 30.30% | -3.50% | -0.90% |
| Nominal yearly compensation | 43,993.40 | 45,483.80 | 47,024.69 | 48,617.78 |
| Number of employed persons (headcount) | 86,936 | 85,412 | 83,887 | 82,362 |

*Source: Pelanteri (ZIPAR)*

***Poor infrastructure particularly energy and transport***

Sections of Zambia's road and rail infrastructure are in a poor state of maintenance. Because rail remains largely inefficient, mineral output from Zambia is predominately transported via road which is a more costly mode of transportation. According to the Economic Outlook report on Zambia by the African Development Bank, transport costs add up to 40% of the cost of the final product. The country requires more efficient rail and road transport to reduce the cost of transporting mineral output to consumers. Notably, in 2012 Government allocated $120 million towards the rehabilitation of Zambia Railways Limited aimed at reviving the national railways and making it the mainstay of carrying heavy goods.

Additionally, trading across borders remains a challenge for Zambia as indicated by the World Bank Ease of Doing Business Index. Zambia consecutively ranked 177 out of 189 countries in 2014 and 2015 on the Trading Across Borders Index. Reduced documentation for imports and exports would expedite the movement, release and clearance of goods. Further, streamlined border procedures and measures addressing factors affecting inland transit time such as the quality of roads and vehicles, efficiency of checkpoints, road blocks, accidents, and border waiting times can reduce costs.

In 2015, power cuts (load shedding) intensified owing to a power deficit of MW 560 that comes in the wake of the 2014/2015 poor rainfall and subsequent low water levels in the Kariba Dam. In light of this deficit, power cuts are frequently used as a temporary electricity rationing measure and this practice has been extended to the mining sector. The disruptions in power supply pose challenges to investments in the sector due to the negative effect on business operations. This dire situation has already triggered reactions from the mining sector. For instance, First Quantum Minerals closed its Sentinel copper processing plant following a reduction in electricity supply by 24% for its operations (Reuters).

Notwithstanding the current status quo, electricity generation is estimated to increase following the operationalisation of short-medium term measures namely the Itezhi-Tezhi hydro power plant (120 MW) expected in November 2015; Maamba coal fired power station (300 MW) expected in January & March 2016 among other power projects.

***Fiscal regime instability***

The challenges with the fiscal regime in Zambia are mainly on two fronts: VAT refunds and the mining tax regime. VAT Rule 18 as initially set out in 1997 required exporters seeking VAT refunds to provide proof of export as a basis for VAT refund claims for exported goods. However in 2013, VAT Rule 18 was amended to include provisions which require proof of sale in addition to proof of export. The proof of sale was considered unreasonable by Zambian exporting firms because of the challenge in obtaining this proof. Government consequently halted the payment of VAT refunds which resulted in protracted arrears in sizable VAT refunds of $600 million. This threatened the operations of many exporting firms and led to an impasse between Government and mining firms. Notably, in 2015,

Government relaxed the VAT rule and allowed for the acceptance of transit documents for VAT refund claims.

Secondly, in a bid to get a more equitable share of wealth from Zambia's mineral resource, Government proposed a radical change to the mining tax regime in the 2015 National Budget. This saw corporate income tax and variable income tax being abolished and mineral royalty being increased and retained as the final tax levied on gross value. In the one-tier tax system, mineral royalty was increased from 6% to 8% for underground operations and to 20% for open pit mining operations. This change was largely untested and deviated from international best practice (two-tier system). The Zambia Chamber of Mines noted that the new system would severely penalize the majority of mining operations whose operational costs were significantly higher than other copper-mining firms in the world. Further, the tax system was flawed in that it did not take into consideration mining firms' profitability and the declining international commodity prices.

**Table 3: International Mineral Royalties for Copper and corporate income tax**

| Country | Mineral royalty | Definition of Base | Corporate Income Tax on profits |
|---|---|---|---|
| **Zambia** | 8% -underground<br>20 % -open pit | Gross value<br>Gross value | 0 % |
| **Australia** | 4 %<br>18 % | Ex-mine value<br>Net value of mineral | 30 % |
| **Canada** | 15 % | 2 % Net current proceeds + 13 % net revenue | 15 % |
| **Chile** | 0-5 % | Total sales, varies by volume | 18.5 % |
| **China** | 2 % | Ad valorem royalty + per unit charge | 25 % |
| **DRC** | 2 % | Net sales value | 30 % |
| **Mongolia** | 5 % ( base rate) | Sales value | |
| **Peru** | 1-3 % | Gross value | 30 % |

*Source: ZIPAR*

Nevertheless, following consultations with mining firms, Government revised the taxation regime in 2015 to the following: 9% mineral royalty for open cast and underground mining operations; reintroduced corporate income tax on income earned from mining operations and processing at 30% and 35% respectively; and reinstated variable income tax on profits at 50%. However, the new proposed tax regime is still considered unfavourable in view of the current global trends in commodity prices and high costs of production facing the mining sector.

***Limited backward and forward linkages in mining***

Zambia has not fully harnessed the benefits from the mining sector owing to the historically weak backward and forward linkages in the mining value chain. Typically, mining firms in Zambia source their manufactured goods, equipment and consumables from South Africa and other parts of the world which are more competitive. This is largely because local manufacturers lack the capacity to deliver the more complex, high value-added products that account for the majority of mines' spending at a sufficient quality and quantity to meet the needs of the mines[9]. Zambia therefore needs to develop a competitive manufacturing base that is capable of supplying reliably, a number of key products required by the mines in the long run. This is crucial to establishing strong backward linkages with local suppliers as well reducing input costs for mining firms.

On the other hand, value addition to various commodities is very limited in Zambia. Many commodities are exported in their raw form or semi-processed forms which reduces Zambia's benefit from its mineral wealth. There is an increasing urgency to strength forward linkages in mining. Achieving this requires Government to play its role of providing a conducive business environment that addresses constraints to industrial development such as

poor infrastructure, policy inconsistency, poor market linkages, lack of access to finance, high taxes on inputs among others. This would substantially reduce manufacturing costs and promote investments in manufacturing.

## Opportunities for Investment in the Mining Sector

***Mineral Exploration and Excavation***

Zambia is endowed with deposits of mineral resources which offer the country potential to increase exploration for the development of new mines and the diversification of the mining sector. Although mining is predominantly concentrated in copper and cobalt, Zambia has a diverse wealth of mineral resources which present investment opportunities in the exploration and extraction of other minerals. Opportunities lie in energy minerals namely oil, gas and uranium; precious metals such as gold, silver, diamonds and gemstones; lead and zinc; industrial minerals such as phosphates, limestone, dolomite etc. and other minerals described in Annex 1 to 3. Annex 4 describes the mining rights in Zambia and licence fees.

**Mining Support Services**

Zambia's mining sector offers investors opportunities to leverage on the backward and forward linkages in mining. The following illustrate investment opportunities that can optimised in the mining value chain:

### i. *Provision of Operations and Maintenance Services for Mining Machinery*

The provision of operational and period maintenance services of mining equipment owned by operational mining companies in Zambia.

### ii. *Provision of Transportation Services*

The mining sector offers opportunities for the provision of transport services to convey mineral output to consumers

### iii. *Supply of Mining Equipment*

The mining sector offers would-be investors prospects to supply heavy or light mining equipment such as earthmoving mining equipment, drilling rigs, explosives, beneficiation equipment, trucks, lighting and safety and protective equipment etc.

***Case Study: Kansanshi Copper Mine***

The Kansanshi mine is the largest copper mine in Africa owned and operated by Kansanshi Mining PLC and is owned by a First Quantum subsidiary (80%) and a subsidiary of ZCCM (20%). The mine is located approximately 10 kilometres north of the town of Solwezi and 180 kilometres to the northwest of the Copperbelt town of Chingola.

From an initial production capacity of 110,000 tonnes of copper in 2005, Kansanshi is now capable of producing 340,000 tonnes of copper and more than 120,000 ounces of gold per year following several expansions. The mining firm has a multi-stage expansion project that aims to increase copper output capacity to approximately 400,000 tonnes by 2015. Mining is carried out in two open pits, Main and northwest using conventional open pit methods and employing hydraulic excavators and a fleet of haul trucks.

**2013 Facts and Stats:**

- Total copper production (tonnes): 270,724
- Gold produced (ounces): 167,395
- Type of mine: open pit
- Current estimated mine life: 17 years
- Employees: 1,700


Kansanshi Open Pit Mine

### Multi-Phase Expansion:

*Expansion in production capacity from 2012 to 2017 includes:*

- 2012 - 2015 60% increase in overall production capacity
- 2012 - 2014 130% increase in oxide production capacity
- 2014 - 2017 90% increase in sulphide production capacity

### Exploration:

- More than 120,000 metres of resource development drilling has been completed
- Updated minerals resource estimate shows increases of 121% in the resource tonnage and 74% in total contained copper metal
- Targeted in-fill drilling in 2013 will focus on adjacent areas of inferred mineral resources

### Outlook:

- Production in 2014 is expected to be between 255,000 and 270,000 tonnes of copper, and 145,000 and 160,000 ounces of gold

*Source: http://www.first-quantum.com/our-business/operating-mines/kansanshi/*

| SWOT SUMMARY | |
|---|---|
| **STRENGTHS** | **WEAKNESSES** |
| • *Diverse Mineral Occurrences in Zambia*<br>• *Growing Foreign Direct Investment in the Mining Sector*<br>• *Government support (fiscal and non-fiscal incentives)* | • *High Production Costs*<br>• *Poor infrastructure particularly energy and transport*<br>• *Fiscal regime instability*<br>• *Limited backward and forward linkages in mining* |
| **OPPORTUNITIES** | **THREATS** |
| • *Mineral Exploration and Excavation*<br>• *Mining Support Services*<br>- *Supply of Mining Equipment*<br>- *Provision of Operations and Maintenance Services for Mining Machinery*<br>- *Provision of Transportation Services* | • *External Commodity Price Shocks*<br>• *High cost and limited access to long-term finance*<br>• *Poorly perceived policy environment* |

## THREATS

***External Commodity Price Shocks***

The profitability of mining companies like any other business is largely dependent on the price goods produced can obtain on markets. Because commodities are largely traded on international markets, they are susceptible to prevailing international demand and prices. This makes mining firms highly vulnerable to external commodity price shocks. According to the Zambia Chamber of Mines, over half of Zambia's copper production was in a loss-making position following a consistent decline in the international copper price in 2014 through to 2015.

In August 2015, copper prices dropped to their six year since July 2009 at $5,121 per metric tonne, this follows lower industrial production and demand for copper in China and an unexpected drop in German industrial production (Bloomberg). Until the pace of industrial growth rebounds in China or surges in other emerging economies, commodities prices are expected to remain low.

***High cost and limited access to long-term finance***

Local high interest rates and short term financing is likely to limit investments into intensive mining projects. Following the introduction of the Bank of Zambia (BOZ) Policy Rate to better effect monetary policy, commercial bank lending rates reduced to an average of 16% in 2012 from as high as 26.4% in December, 2010. Nevertheless, the pass-through inflationary effects of the depreciation of the kwacha in the first quarter of the year 2014 led to an upward revision in the BOZ policy rate and consequently interest rates. Currently, the BOZ Policy Rate stands at 12.5% and in December, 2014, bank lending interest rates averaged 20.5%. Interest rates are expected to rise even more as Government further tightens monetary policy to moderate the continued depreciation of the kwacha.

***Poorly perceived policy environment***

Findings from the survey on mining companies conducted by the Fraser Institute shows that Zambia scored 52.4 out of 100 in 2014 up from 48 in 2013 on the Policy Perception Index. This composite index measures the overall policy attractiveness of 122 mining jurisdictions including Zambia. Policy factors examined include uncertainty concerning the administration of current regulations, environmental regulations, regulatory duplication, the legal system, the taxation regime, uncertainty concerning protected areas and disputed land claims, infrastructure, socioeconomic and community development conditions, trade barriers, political stability, labour regulations, quality of the geological database, security, and labour and skills availability. Zambia compares favourably with other top copper producing countries in the world on the Policy Perception Index as shown in table 4 below.

**Table 4: Selected Top Copper Producing Countries and Policy Perception Index Ranking**

| Copper Production Rank 2014 | Country | Production (000 tonnes) | Policy Perception Index Rank 2014 |
|---|---|---|---|
| **1** | Chile | 5,745 | 72.23 |
| **2** | China | 1,614 | 20.73 |
| **4** | Peru | 1,339 | 53.88 |
| **6** | DR Congo | 905 | 27.85 |
| **7** | Russia | 753 | 30.49 |
| **8** | Zambia | 725 | 52.35 |
| **10** | Mexico | 522 | 52.02 |

*Source: Reuters and Fraser Institute*

Zambia's private sector often bemoans policy inconsistency by Government and the lack of inclusive consultations on major policy decisions affecting the

operations of the private sector. Particularly, the introduction of Statutory Instrument number 55 – now suspended – authorising the Central Bank to monitor the flow of international transactions was a serious concern for many exporting and importing firms including mining firms on account of the bureaucracies associated with the Instrument. Notwithstanding, the Zambia Business Council, a high-level Private Sector Development dialogue structure for public-private dialogue was revamped to address issues affecting the business environment, investments and doing business in Zambia.

## Policies, Strategies and National Plans to boost the Mining Sector

***Vision 2030***

The vision for the mining sector as elucidated in the country's long term development plan is a well-organized private sector led mineral resource exploration and exploitation that contributes to sustainable social economic development by 2030. To achieve this, measures include improving regulation, supervision and enforcement of statutory commitments in the mining sector, strengthening tracking of potential investors and improving the efficiency of the system of logging, dissemination of information on available plots for mining and recording of commercial mining activities.

***Revised-Sixth National Development Plan (R-SNDP)***

Mining remains a priority growth sector notwithstanding calls for diversification from mining. Over the period 2013-2016, the country's objective is the completion of the revision of mining, petroleum and legislature on explosives. These revisions are aimed at facilitating mineral diversification away from copper and cobalt to nickel, gold, manganese, iron and uranium; an increase in exploration activities, ensuring sustainable production and management of mineral resources; promoting a productive relationship between the mines and mine suppliers to contribute to growth of MSMEs and job creation; and promoting value addition through industrial development.

***Mineral Resource Development Policy***

This policy puts forth measures for the creation of a sustainable and orderly mining industry that contributes to the economic development of Zambia by: attracting local and foreign investment in the sector for the sustainable exploration and exploitation of mineral resources; integrating the mining sector in the domestic economy; and ensuring acceptable health, safety and environmental protection standards.

***The Mines and Mineral Act, 2015***

The Act repeals and replaces the Mines and Mineral Act of 2008 and provides for safety, health and environmental protection in mining operations and for the establishment of the Mining Appeals Tribunal. The Act also provides guidelines for mining and non-mining rights; exploration and mining licences; mineral pressing licences; gold panning certificates; mineral trading, import and export permits; authorisation for radioactive minerals; and mineral Analysis among others.

## Roles of Key Stakeholders in the Mining Sector

***Ministry of Mines and Mineral Development:***
This Ministry of Mines and Mineral Development until recently was part of the amalgamated Ministry of Mines, Energy and Water Development. The principal function of the Ministry is the development and management of mineral, energy and water resources in a sustainable manner for the benefit of the people of Zambia.

***Contact Details***
Tel: + 260 211 223930
Address: Kwacha House, Cairo Road, Lusaka
Website: http://www.mmewd.gov.zm

***Chamber of Mines of Zambia:***
The objective of the Chamber of Mines of Zambia is to promote the interests of its members; and encourage, protect and foster the Mining Industry of Zambia.

***Contact Details***
Tel: Tel: + 260 211 258383/ Tel: + 260 211 258384
Email: info@mines.org.zm
Address: Plot No. 20849 Alick Nkhata Road, Mass Media area, Lusaka
Website: http://mines.org.zm

***Zambia Development Agency (ZDA):***
The focus of the agency is investment promotion and privatization; exports promotion and market development; and micro and small enterprises. ZDA provides investment incentives for businesses investing in priority sectors and provides information on the available investment opportunities.

***Contact Details***
Tel: +260 211 252 288 / 253 640
Email: info@zda.org.zm
Address: Privatisation House, Nasser Road, Lusaka
Website: http://www.zda.org.zm

## Other Useful Contacts

**Patents and Company Registration Agency (PACRA)**
Tel: +260 211 255151/255127
Email: pro@pacra.org.zm
Address: Mwayi House, Haile Selassie Avenue, Longacres, Lusaka
Website: http://www.pacra.org.zm

**Zambia Environmental Management Agency (ZEMA)**
Tel: +260 211 254023/59
Address: Corner of Church and Suez Roads, Plot No. 6975, Ridgeway, Lusaka.
Website: http://www.zema.org.zm

**Zambia Revenue Authority (ZRA)**
Tel: +260 211 381111
Email: advice@zra.org.zm
Address: Kalambo Road, Lusaka
Website: https://www.zra.org.zm

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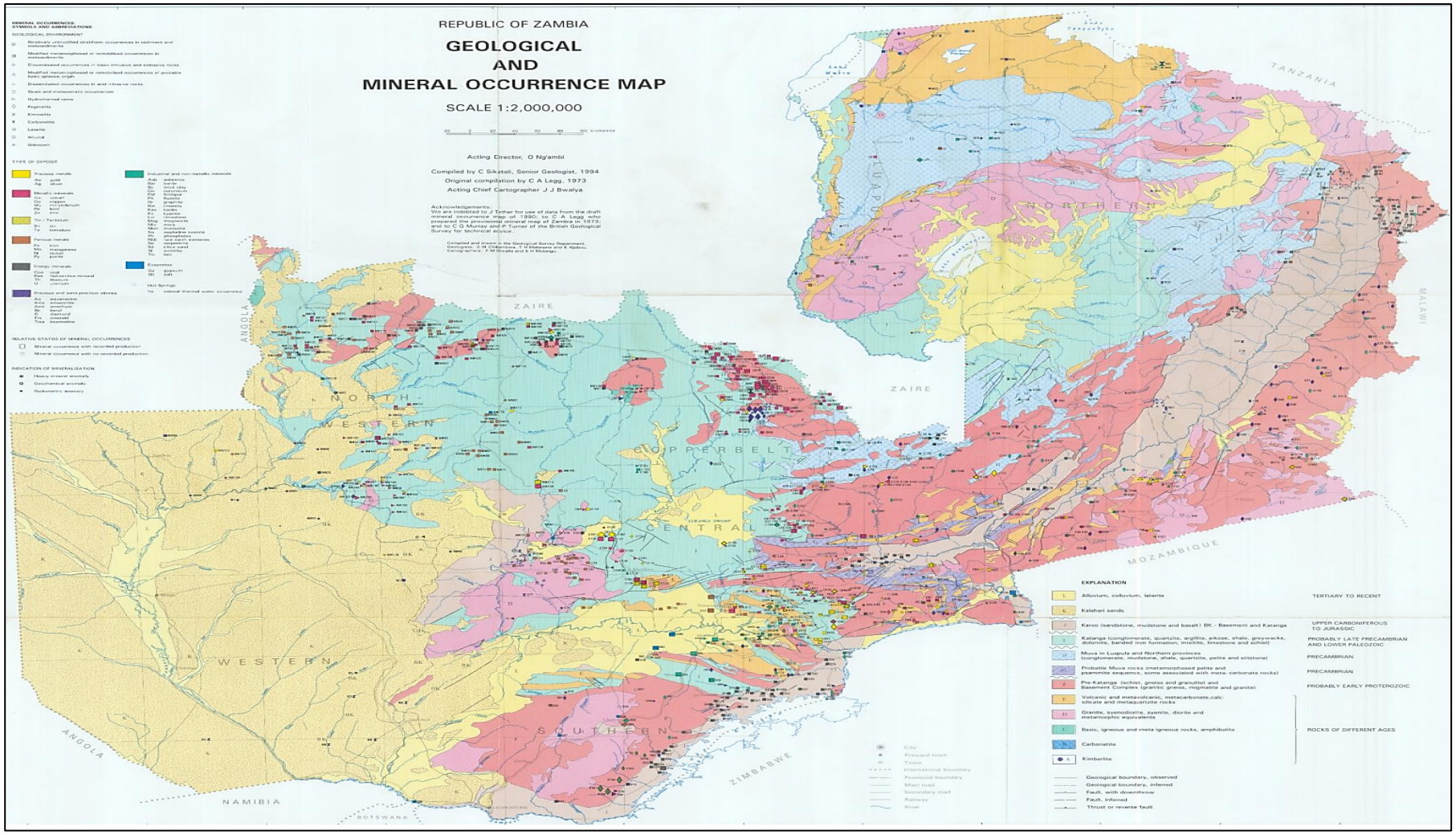
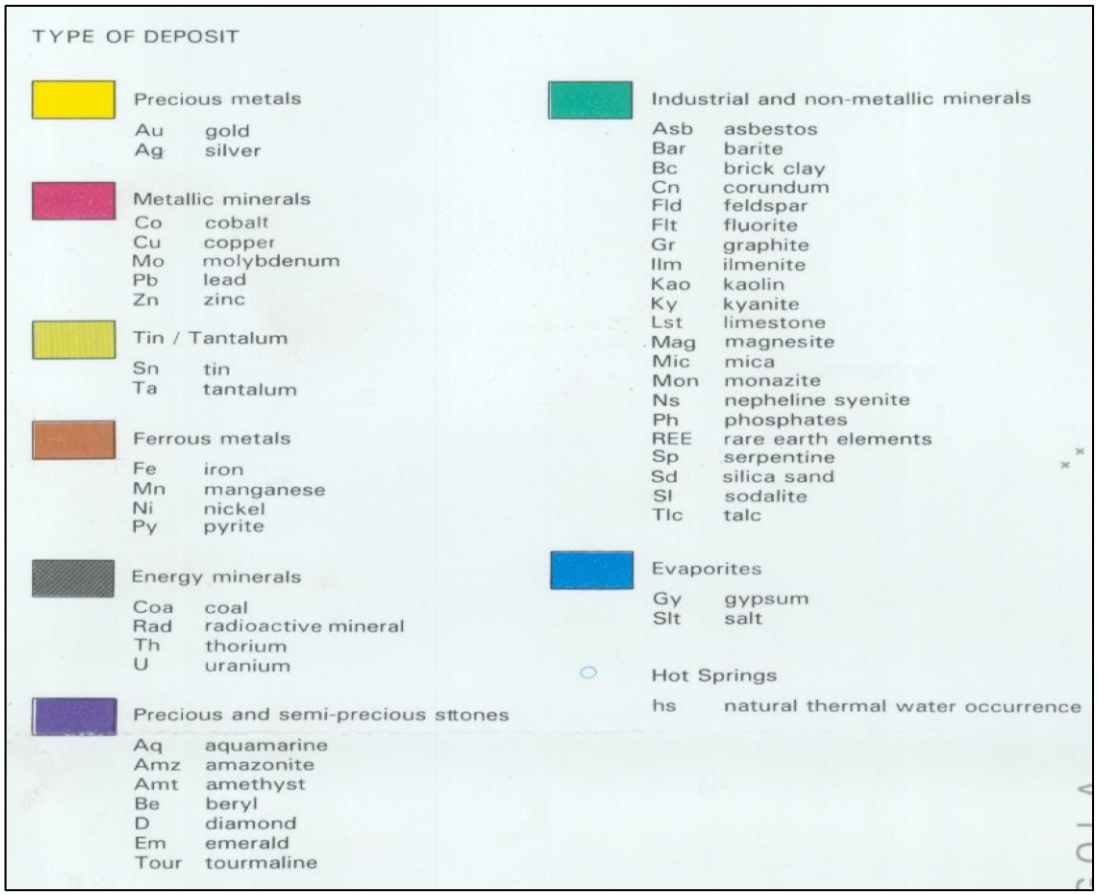
## Annex 1: Geological and Mineral Occurrence Map



## Key to Mineral Occurrences Map above



TYPE OF DEPOSIT

Precious metals
- Au gold
- Ag silver

Metallic minerals
- Co cobalt
- Cu copper
- Mo molybdenum
- Pb lead
- Zn zinc

Tin / Tantalum
- Sn tin
- Ta tantalum

Ferrous metals
- Fe iron
- Mn manganese
- Ni nickel
- Py pyrite

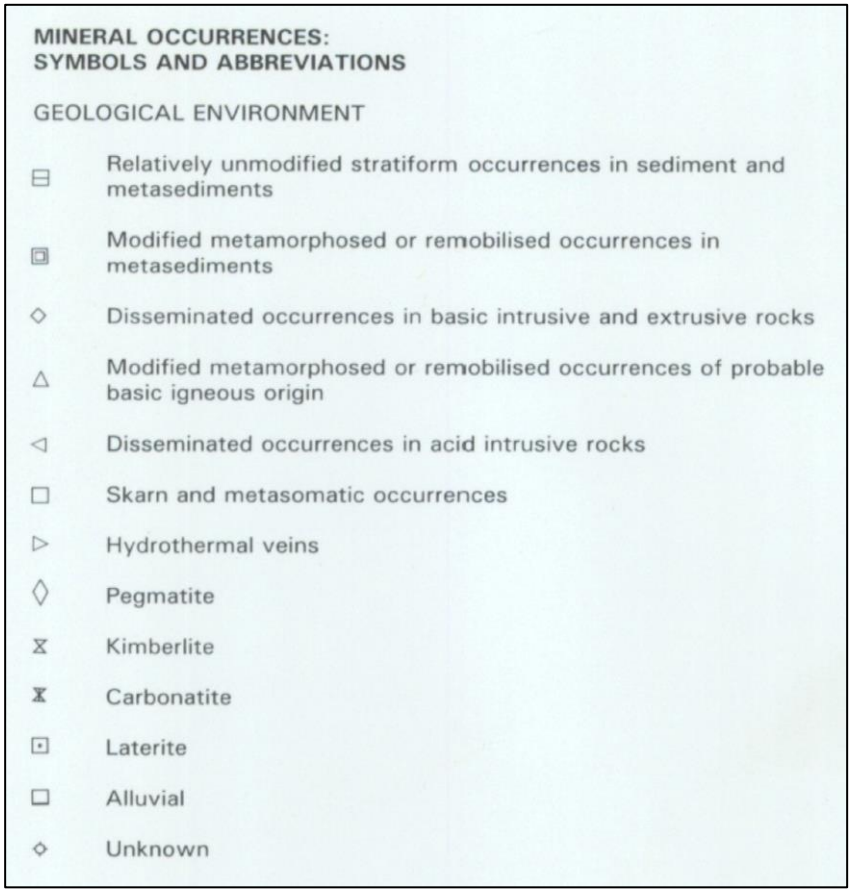
Energy minerals
- Coa coal
- Rad radioactive mineral
- Th thorium
- U uranium

Precious and semi-precious sttones
- Aq aquamarine
- Amz amazonite
- Amt amethyst
- Be beryl
- D diamond
- Em emerald
- Tour tourmaline

Industrial and non-metallic minerals
- Asb asbestos
- Bar barite
- Bc brick clay
- Cn corundum
- Fld feldspar
- Flt fluorite
- Gr graphite
- Ilm ilmenite
- Kao kaolin
- Ky kyanite
- Lst limestone
- Mag magnesite
- Mic mica
- Mon monazite
- Ns nepheline syenite
- Ph phosphates
- REE rare earth elements
- Sp serpentine
- Sd silica sand
- Sl sodalite
- Tlc talc

Evaporites
- Gy gypsum
- Slt salt

Hot Springs
- hs natural thermal water occurrence

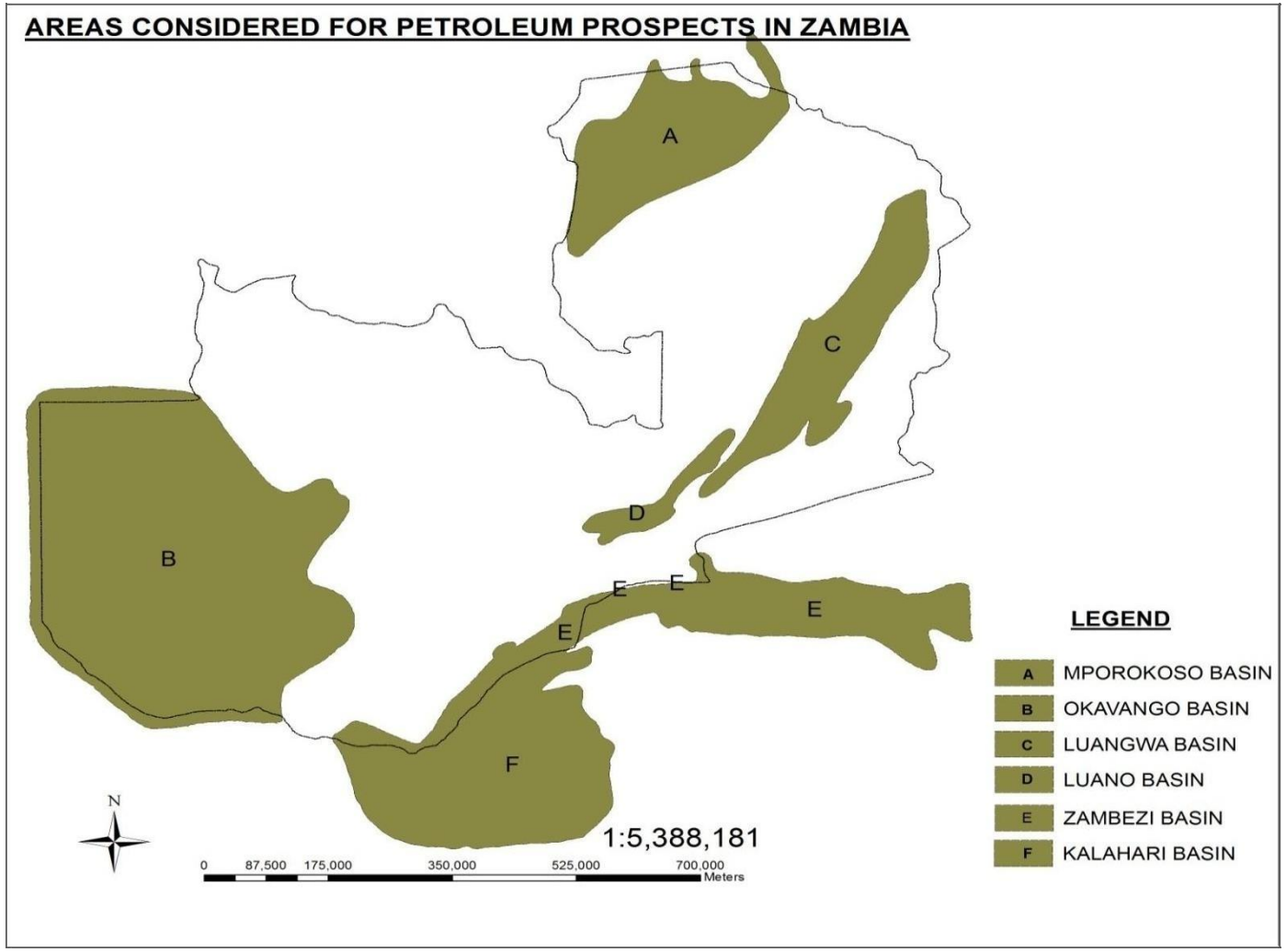


MINERAL OCCURRENCES:
SYMBOLS AND ABBREVIATIONS

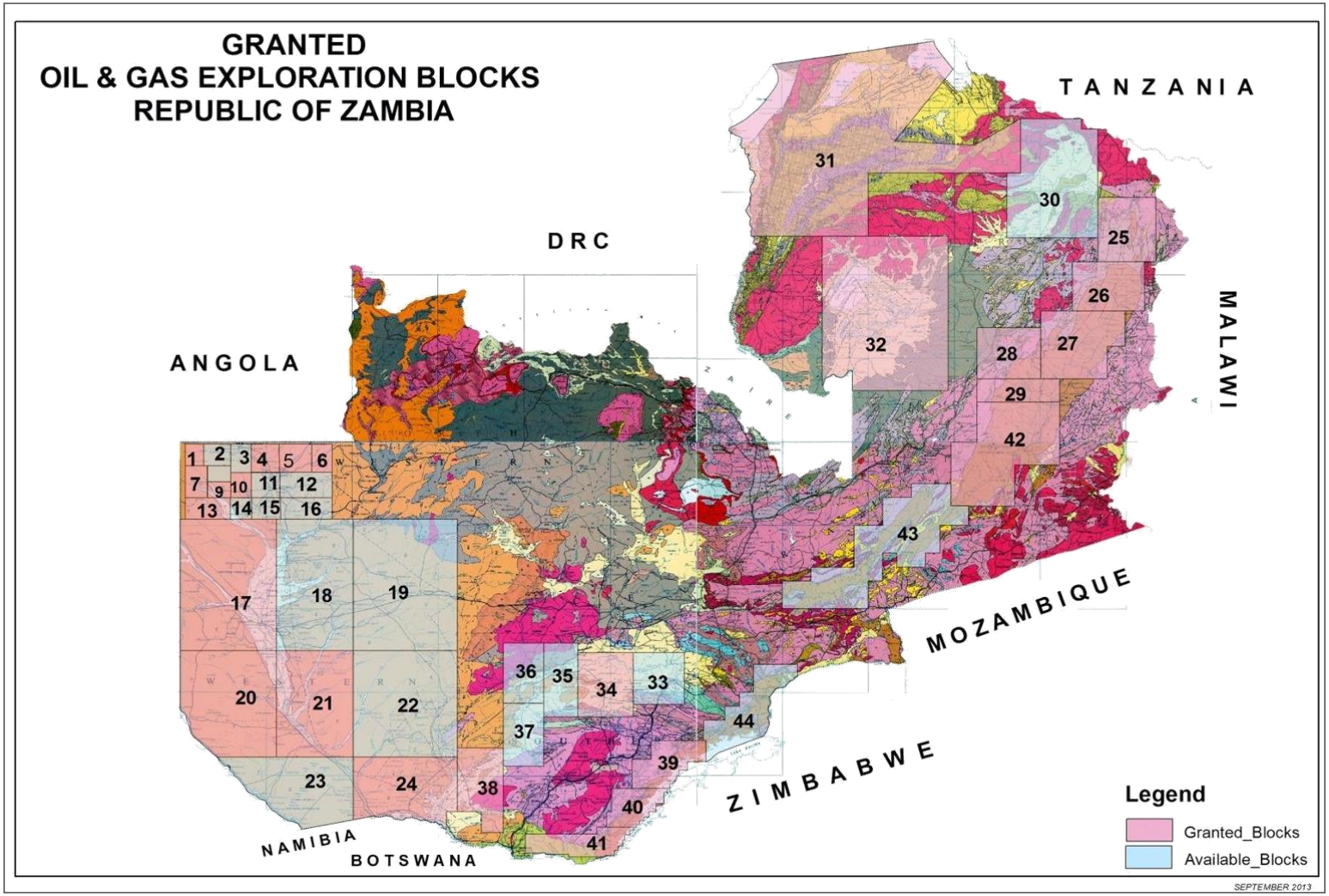
GEOLOGICAL ENVIRONMENT

- Relatively unmodified stratiform occurrences in sediment and metasediments
- Modified metamorphosed or remobilised occurrences in metasediments
- Disseminated occurrences in basic intrusive and extrusive rocks
- Modified metamorphosed or remobilised occurrences of probable basic igneous origin
- Disseminated occurrences in acid intrusive rocks
- Skarn and metasomatic occurrences
- Hydrothermal veins
- Pegmatite
- Kimberlite
- Carbonatite
- Laterite
- Alluvial
- Unknown

## Annex 2: Sedimentary basins with potential Oil and Gas



## Annex 3: Granted Oil and Gas Exploration Blocks



## Annex 4: Mining Rights In Zambia – Prescribed Fees, Max. Area, Area Charges & Tenure (Mines & Minerals Development Act of 2008, SI No. 17-2013)

| Licence Type | Validity Period | Max. Area | Renewal | Minerals Applicable | Licence Fee ZMW | Area Charges (ZMW/ha/year) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.0 LARGE-SCALE MINING OPERATIONS PART II** | | | | | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 |
| 1.1 Exploration Licence (ha) | 4 years | 100, 000 ha | Yes, not later than 90 days, max. 2 years per renewal with 50%% area reduction, 7 years max. tenure | All minerals except gemstones | 1, 800.00 | 0.72 | 0.72 | 2.16 | 2.16 | 2.88 | 2.88 | 3.96 |
| | | | | | | Minimum Expenditure (ZMW/ha/year) | | | | | | |
| | | | | | | 7.20 | 7.20 | 21.60 | 21.60 | 28.80 | 28.80 | 39.60 |
| 1.2 Large Scale Mining Licence (ha) | 25 years | 25, 000 ha | Yes, not later than 1 year, mx. 25 years per renewal | All minerals except gemstones | 28, 800.00 | 10.08 | 10.08 | 10.08 | 10.08 | 10.08 | 10.08 | 10.08 |
| 1.3 Large Scale Gemstone Licence (ha) | 10 years | 25, 000 ha | Yes, not later than 1 year, max. 10 years per renewal | Gemstones | 28, 800.00 | 36.00 | 36.00 | 36.00 | 36.00 | 36.00 | 36.00 | 36.00 |
| **2.0 SMALL-SCALE MINING OPERATIONS PART II** | | | | | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 |
| 2.1 Prospecting Licence (ha) | 5 years | 10, 000 ha | No | All minerals except gemstones | 540.00 | 0.360 | 0.360 | 0.900 | 0.900 | 1.440 | N/Z | N/A |
| | | | | | | Minimum Expenditure (ZMW/ha/year) | | | | | | |
| 2.2 Small Scale Mining Licence (ha) | 10 years | 400 ha ($4km^2$) | Yes, not later than 60 days, max. 10 years per renewal | All minerals except gemstones | 2, 700.00 | 5.04 | 5.04 | 5.04 | 5.04 | 5.04 | 5.04 | 5.04 |
| 2.3 Small Scale gemstone Licence (ha) | 10 years | 400 ha | Yes, not later than 60 days, max. 10 years per renewal | Gemstones | 2, 700.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 |
| **3.0 ARTISANAL MINING IV** | | | | | | | | | | | | |
| 3.1 Artisan's Mining Right (ha) | 2 years | 6.68 ha | Yes, 60 days, max. 2 years per renewal | All minerals | 540.00 | 2.52 | 2.52 | N/A | N/A | N/A | N/A | N/A |
| **4.0 OTHERS NON MINING** | | | | | | | | | | | | |
| 4.1 Mineral Processing Licence | 15 Years (25 years) | | Yes, 60 days, max. 2 years per renewal | All minerals except gemstones | 28, 800.00 | | | | | | | |
| | | | | | | Transfer of Control of Holder company (by shares) | | | | | | |
| 4.2 Transfer (LPL, LML, MPL, LGML) | | | | | 28, 800.00 | Licence Type | | | | ZMW | | |
| 4.2 Transfer Fee (SML, SPP & GML) | | | | | 2, 700.00 | LPL, LML, LGML, MPL | | | | 28, 000.00 | | |
| 4.3 Spatial Alteration of LPL, LML, LGML | | | **Note: In 2015, Fee Units were revised upwards by 50% from 20 ngwee to 30 ngwee. All fees will therefore be adjusted accordingly. In this regard, Government has put a moratorium on the issuance of mining licences pending this the revision in licence fees and charges** | | 540.00 | SML, SPP, GML | | | | 2, 700.00 | | |
| 4.4 Spatial Alteration of SPP, SML, SGML | | | | | 450.00 | LPL-Large Scale Prospecting Licence<br>LML-Large Scale Mining Licence<br>LSGL-Large Scale Gemstone Licence<br>SPP-Small Scale Prospecting Permit | | | | SML-Small Scale Mining Licence<br>GL-Gemstone Licence<br>MPL-Mineral processing Licence<br>NOTE: Minimum expenditure/ha/yr applies to LPL | | |
| 4.5 Spatial Alteration of Artisan Mining Right | | | | | 90.00 | | | | | | | |

## Endnotes

[1] MoF, 2016 National Budget Speech
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[3] Helbling, T. et al. (2008) Commodities Booms-Riding a Wave
[4] MoF 2014 Annual Economic Report
[5] UNCTAD (2011) An Investment Guide to Zambia: Opportunities and Conditions
[6] ZDA, (2015) Mining Sector Profile
[7] DFID & World Bank (2011) What Would it Take for Zambia's Copper Mining Industry to Achieve Its Potential?
[8] Ibid
[9] Ibid