



Mining; leveraging from backward and forward linkages for diversified growth and wealth creation

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ABBREVIATIONS

BN	Background Note
FDI	Foreign Direct Investment
MCTI	Ministry of Commerce Trade and Industry
SME	Small Medium Enterprise
IMF/WB	International Monetary Fund and World Bank
UNECA	United Nations Economic Commission for Africa
UNIP	United Nations Independence Party
GDP	Gross Domestic Product
ZCCM	Zambia Consolidated Copper Mines
MMD	Movement for Multi-Party Democracy

Mining Background Note

Mining; leveraging from backward and forward linkages for diversified growth and wealth creation

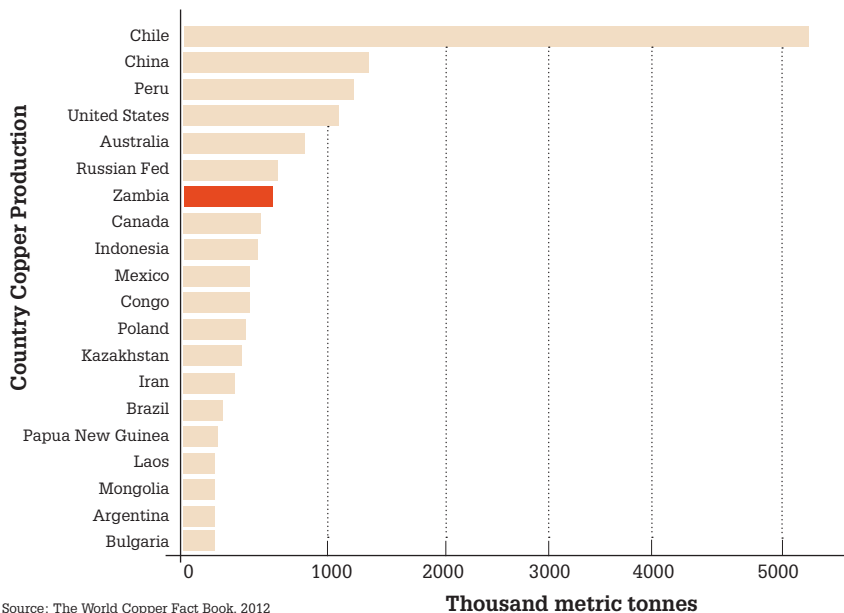
BACKGROUND NOTE

Zambia is richly endowed with substantial mineral wealth and yet continues to be ranked among the poorest countries in the world. In order fully realize its mining potential, Zambia must adopt comprehensive, development-driven policies that move beyond a narrow focus on copper to other minerals and effectively link mining to the other economic sectors. This would lead to significant poverty reduction and sustainable job and wealth creation.

Zambia is the seventh largest producer of copper and is among the largest producers of cobalt worldwide (The World Copper Fact Book, 2012, See Figure 1). Zambia is also richly endowed with other mineral deposits including gold, uranium, gemstones and coal (Nyambe and Phiri, 2010). The mining sector has thus been the key driver of Zambia's economy dating back to the colonial era.

In 2012, mining accounted for up to 80% foreign exchange earnings and attracted Foreign Direct Investment (FDI) worth up to US\$991 million (World Bank, 2012) making Zambia one of the fastest growing economies in the world at a 7.3% growth rate (ibid, 2012).

Figure 1: Copper Mine Production by Country: Top 2011 (Thousand metric tonnes)



Source: The World Copper Fact Book, 2012

Regrettably, such mineral wealth and impressive macro-economic growth has not adequately translated into poverty reduction, job creation or economic diversification for Zambia.

- 60.5% of the Zambian population lives below the poverty line (World Bank, 2010).
- In 2012, 15.3% of the labour force in urban areas were unemployed (Labour Force Survey Report, 2012)
- Zambia was ranked 164 out of 187 countries on the Human Development Index (2011).

A major factor limiting this sector's contribution to broad-based growth is the absence of a comprehensive, development-oriented and robust mining policy framework that effectively links mining to other key sectors of the economy such as manufacturing, education and agriculture for sustainable growth and improved livelihoods.

This Background Note (BN) provides a historic to current account of the metallic mining¹ sector in Zambia. The BN reviews approaches to mining and country development by various Zambian governments, from the colonial era to date. It specifically seeks to trace mining development in Zambia and the extent to which mining has been linked to other sectors of the economy. It particularly focuses on manufacturing, education and skills development. The BN highlights the factors that have constrained the full potential of the mining sector and opportunities and strengths that must be leveraged if the sector is to contribute to increased employment, wealth creation and poverty reduction.

Colonial Era

Industrial copper mining in Zambia begun in the 1930s². Driven by a strong profit motive, mineral surveys were done and between 1920 and 1950 large mineral deposits were discovered. The mining sector was dominated by two major mines; Roan Selection Trust and Rhodesian Anglo American Corporation (Noyoo, 2007). Copper production during this period rose from an output of approximately 50,000 tonnes in 1935 to a peak of approximately 570,000 tonnes in 1962 prior to independence (Limpitlaw, 2011). The copper industry propelled the Zambia's GDP from being one of the smallest to one of the largest in Africa. Zambia's economy was characterized by a narrow view to extraction and export of copper with little efforts to diversify the economic base for sustainable growth in other sectors.

Zambia's manufacturing capacity was largely left undeveloped during the colonial era with the exception of the mining sector. The colonialists instead

¹ This Background Note will specifically focus on mining of metals while other minerals will be considered in subsequent papers.

² First carried out by Cecil John Rhodes of the British South Africa Company

focused of building the manufacturing capacity of Southern Rhodesia (Zimbabwe), which supplied Zambia with most manufactured commodities except for maize-meal, which was processed locally (Economist Intelligence Unit, 2003). There was therefore no deliberate focus on value-addition or the development of manufacturing capacity, that was derived from the mining process.

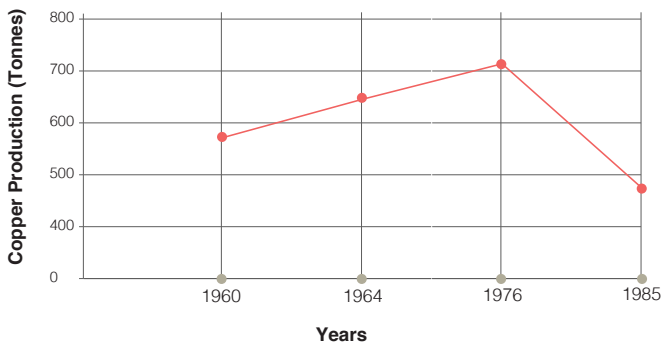
Similarly, the colonial administration neglected investment in education in Zambia. At independence, Zambia had only approximately 100 university graduates and less than 1,500 holders of a complete secondary school certificate (Mwanakatwe, 1968). This resulted in a very narrow educated workforce, which later failed to effectively operate the mining industry as well as other manufacturing enterprises that were nationalized in the Second Republic (Grant, 2007).

The only linkages created to other sectors were those incidental to mining, For example infrastructure development and roads constructed were mainly for transportation of copper to export markets and not to link strategic locations within the country (UNECA, 2013). Mining activities did however lead to the development of five major towns in the Copperbelt; which became Zambia's industrial hub. The economic health of these towns is nevertheless highly reliant on the mining industry.

Mining in the First and Second Republic

At independence, copper production rose to 640,000 tonnes from 570,000 tonnes in 1960 (Limpitlaw, 2011). Production however fell sharply in 1976 from 713,000 tonnes to 479,000 tonnes in 1985 (Karmiloff, 1988) (See Figure 2).

Figure 2: Copper Production (1960-1985)

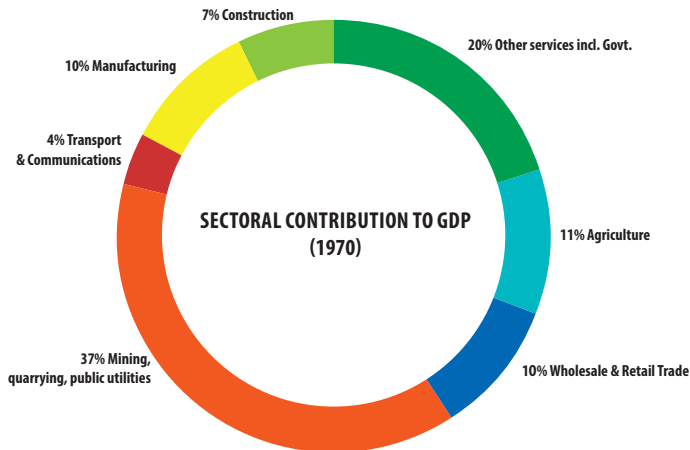


Source Adapted by PMRC from: Karmiloff (1988)

—●— Copper Production (Tonnes)

During the boom of copper prices in the early 60's, 90% of the foreign exchange in the Zambian economy was attributed to copper and to a lesser extent Zinc and Lead. Mining also contributed the largest share to GDP, at 37% in 1970 (See Figure 3) (Kamiloff, 1988).

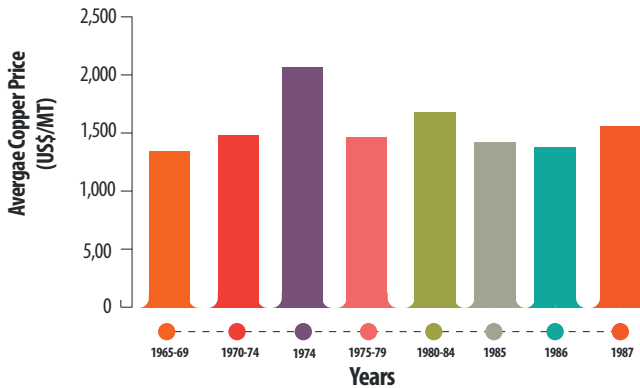
Figure 3: Sectorial-Contribution to GDP (1970)



Source Adapted by PMRC from: (World Bank cited in Kamiloff, 1988)

During the 1st Republic Industrialisation ranked high on the Government's agenda, which led to the adoption of the Import Substitution Industrialisation Strategy (ISI)³. Government established the Zambia Industrial Mining Corporation (ZIMCO), an umbrella body to promote mining, manufacturing and service industries in the country (Encyclopaedia Britannica, 2013). This was an attempt to restructure the economic base and create linkages between mining and other sectors of the economy. Through provision of protective tariffs and state subsidies, manufacturing became one of the fastest growing sectors, at a 12.6% growth rate between 1964 and 1974 and increased its contribution to GDP from 6.3% to 12% during the same period (MCTI, 2007). This investment in manufacturing was facilitated by increased Government revenues from high copper prices. However, ISI proved uncompetitive and unsustainable due to heavy reliance on subsidies and costly importation of spare parts and inputs, which led to a drain on Government revenues and negative Balance of Payments. This unfavourable climate was worsened by high fuel costs and deteriorating terms of trade for primary products (drop in copper prices, See Figure 4 next page) on the global market.

³ A strategy in which Government sought to locally produce imported manufactured products mainly through assembly plants and adoption of turnkey technology

Figure 4: Trends in Copper Prices (1964-1987)

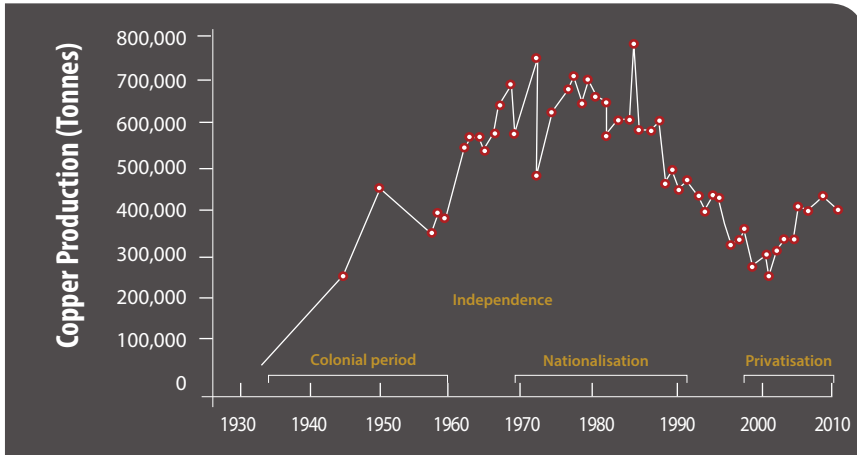
Source Adapted by PMRC from: Karmiloff (1988)

To ensure that copper revenues were translated into jobs and improved service delivery for the Zambians, the UNIP Government nationalized the mines in 1969. This was along with other industries such as transport. Employment rose to 48,000 in the mines (Limpitlaw, 2011) but the sector was constrained in further employment creation due to its capital intensive nature. Standards of living improved especially for those in urban areas (during the pre-1974 period), who received a disproportionate amount of public revenues (Limpitlaw, 2011). The mines were relied upon to supply education, healthcare services, water and sanitation, waste disposal and even recreational services to communities at the expense of reinvestment in mining infrastructure (Noyoo, 2007). The focus on industrialization also led to the sidelining of agriculture and rural development with limited efforts to link mining to agriculture.

With the decline in international copper prices after 1974, copper production plummeted to 490,000 metric tonnes in 1985 from a high of 713,000 metric tonnes in 1976 (Karmiloff, 1988) (See Figure 5). Government revenues from copper and employment similarly reduced, plunging the country in economic crisis (See Figure 6). This forced government to turn to the International Monetary Fund (IMF/WB) for financial aid via the Structural Adjustment Programmes in the 1980s. These programmes had a damaging effect on Zambia's manufacturing industry as it forced government to liberalize the economy (which involved removal of tariff protection from local industries) and privatize many companies. Towards the end of the 1980s, public outrage at the high unemployment rates, shortage of basic commodities and their high price led to the removal of the UNIP Government and a introduction of multi-party politics in 1991 via the Movement for Multi-party Democracy (MMD).

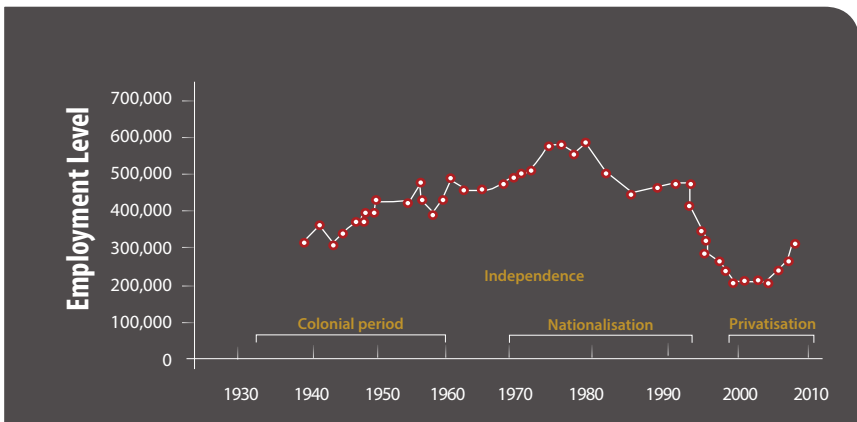
Attempts at promoting manufacturing and public service delivery through mining revenues during this era were largely unsustainable and did not diversify the economy away from copper mining. Improved public service delivery and employment heavily relied on mining revenues which, when withdrawn, led to high unemployment and a food crisis.

Figure 5: Copper production in Zambia (1930-2010)



Source: (Limpitlaw, 2011)

Figure 6: Employment in Copperbelt Mines (1930s - 2010)

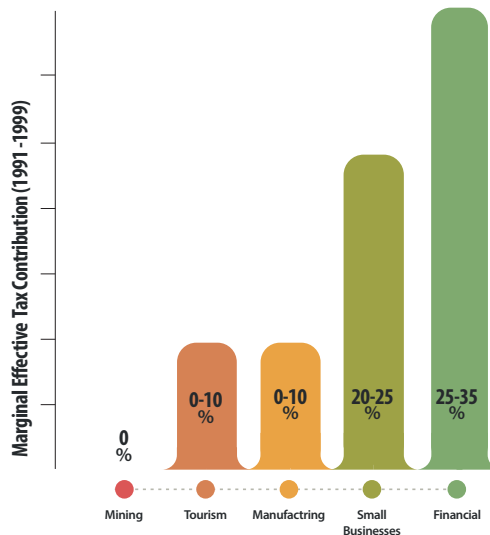


Source: (Limpitlaw, 2011)

Mining in the 3rd Republic

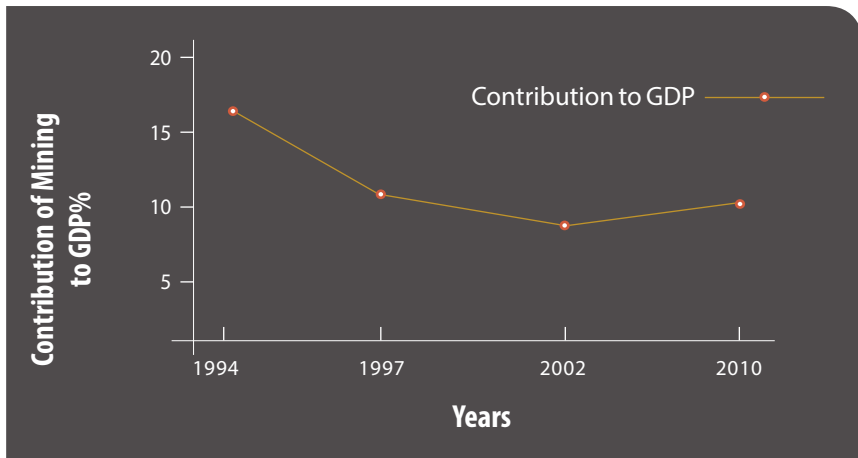
As part of structural adjustment, Zambia, under the supervision of the IMF/WB subdivided and sold the state owned Zambia Consolidated Copper Mines (ZCCM) to private firms. The mines were in a state of disrepair with dilapidated infrastructure and old equipment. Moreover they were running at a loss, due to low copper prices and constituted a high cost to government through high subsidies. The World Bank/IMF therefore insisted that in order to attract Foreign Direct Investment (FDI), Zambia would have to introduce legislation that was favourable to investors. This led to the enactment of the Investment Act and Mines and Minerals Act 1995, which included lenient terms based on “Development Agreements.” These allowed mining investors to be granted exemptions from paying liabilities accrued by ZCCM; pensions owing to workers, and arguably the most important, tax exemptions, for a given time period called the ‘stability period’. The mines thus paid an aggregate tax (Marginal Effective Tax Rate) of 0% during the period (See Figure7 below). (Fraser and Lungu, 2007).

Figure 7: Marginal Effective Tax by Sector (1991-1999)



Source: Adapted by PMRC from: World Bank in Fraser and Lungu (2007)

Mining’s contribution to GDP declined from 16.5% in 1994 to 7.9% in 2002 but later rose to 10.6% between 2001 and 2010 (See Figure 8). GDP per capita similarly fell by -7.5% between 1991 and 1999 (Fraser and Lungu, 2007).

Figure 8: Contribution of Mining to GDP (1994 - 2010)

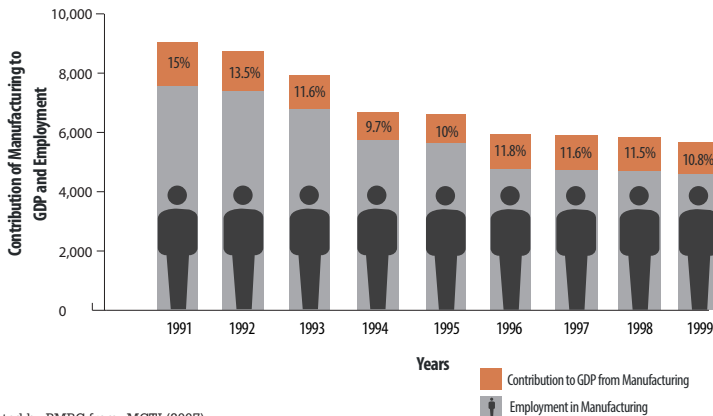
Source: Adapted from Fraser and Lungu (2007) and MCTI, 2007

Privatization led to an immediate surge in unemployment with the loss of 23,000 jobs in mining between 1995 and 2000. Labour laws also had no clear direction on the employment of expatriate staff or differences in salary scales for local and expatriate staff; this encouraged companies to hire highly paid expatriates (Fraser and Lungu, 2007). Although jobs were later created, employment rose to only 31,000 as opposed to the initial 45,000 before privatization (World Bank and UKAid, 2011). Moreover, the employment created was largely of low quality. It was characterized by casualization of labour, in which 45% of employees were placed on contractual employment, which denied them long-term employment benefits (Fraser and Lungu, 2007).

Privatization did however lead to resuscitation of mining operations and increased production and profitability. Closed mines were reopened and recapitalized and new investment led to the opening up of new mines. Moreover, in 2003, there was a global surge in copper prices, which has continued to date. Increased mining revenues did not however immediately translate into a commensurate increase in government revenues due to the continued enforcement of the Development Agreements. The high losses in tax revenue eventually triggered public disapproval and in 2008 led to the amendment of the mining tax regime to allow for increased mineral royalties and windfall tax (World Bank and UKAid, 2011). In 2009, Government proposed mining taxes of 47 % in view of expansion in mineral exploration by the mines and increased capacity. Only towards the end of 2010, did some mining companies begin to pay increased taxes having resisted in the first instance (ibid, 2011).

Privatization did not significantly strengthen linkages between mining and other sectors of the economy. The contribution to GDP from manufacturing reduced to only 10% in 1995 from 15% in 1991 (Figure 9) (MCTI, 2007).

Figure 9: Contribution of Manufacturing to GDP and Employment Levels (1991-1999)



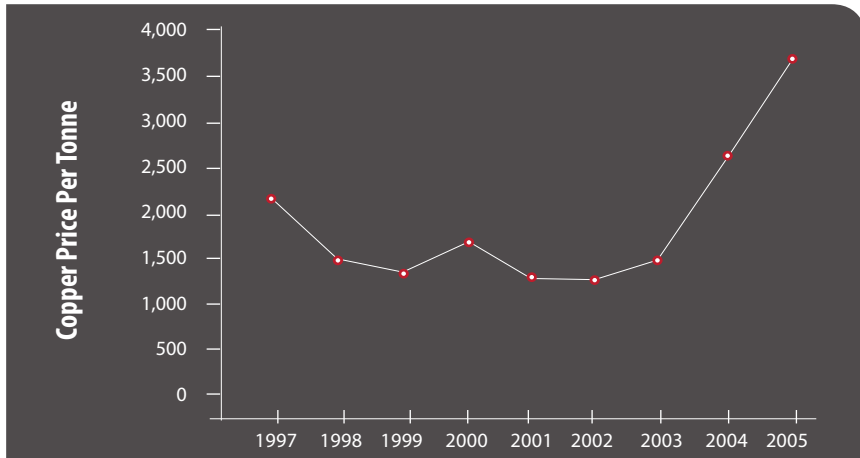
Source: Adapted by PMRC from: MCTI (2007)

Externalisation of profits was another factor that weakened investment in other sectors. This was driven by the fact that the majority of the mines were bought by foreign companies therefore profits from mining were mostly externalised as opposed to being reinvested in growth of other sectors (Fraser and Lungu, 2007). Unlike ZCCM, which supported local producers, new mine owners depended on external suppliers for inputs. The preference for external suppliers was justified on the basis of high prices and low quality of locally produced inputs. Lack of capacity among local businesses to adequately meet mining demand is largely as a result of the lack of a deliberate policy strategy by Government to support local suppliers through protection of local industries, facilitation of effective technological skills transfer to Zambians or provision of incentives for production (Fraser and Lungu, 2007).

Current Context

Currently, mining continues to play a central role in Zambia's economy. Copper production rose from a low of 257,000 tonnes in 2000 to 819,574 tonnes in 2011 (2011 Annual Progress Report - SNRP, 2012) while cobalt production declined from 4,648 to 1,411 tonnes (Zambia Review 2012/13). Prices of copper on the international market also surged in recent years reaching an average of US \$8,811 per tonne in 2011 from US\$1,600 in 1999.

Figure 10: London Metal Exchange Prices, US\$ per tonne of copper, annual averages, (1997 - 2005)



Source: (Fraser and Lungu, 2007)

The sector has thus continued to be a major driver of economic growth with an average share of 9.1% GDP (2006-2009); foreign exchange contribution of 8.5% and 70.3% contribution to formal employment (Sixth National Development Plan, 2011-2015). The mining sector has also received up to US\$5 billion in investments over the past decade (Zambia Review, 2012/13).

However, while the mining sector has prospered, poverty levels in Zambia have remained high with only a 2.3% decline in poverty from 62.8% in 2006 to 60.5% in 2010 (LCMS, 2010). Furthermore, even though mining has contributed to employment growth in the formal sector, its potential contribution to other sectors is yet to be realized. This is especially evident considering the fact that approximately 300,000 graduates are released from higher education institutions into the labour market annually while 90% of Zambia's labour force is in the informal sector. This implies a significant shortfall in terms of available jobs within the country.

Zambia has also thus far largely failed to use the thriving copper sector to diversify its economic base away from copper through effective use of linkages. The Economic Report on Africa, 2013, states that Zambia's export product concentration index stands at 0.63, this indicates that Zambia is amongst the top quarter of African countries with the highest reliance on a single export. Zambia also showed the least amount of trade diversification (0.85) with more than 70% of exports flowing from a single export - copper (ERA Report, 2013). Opportunities for diversification and sustainable wealth creation however still

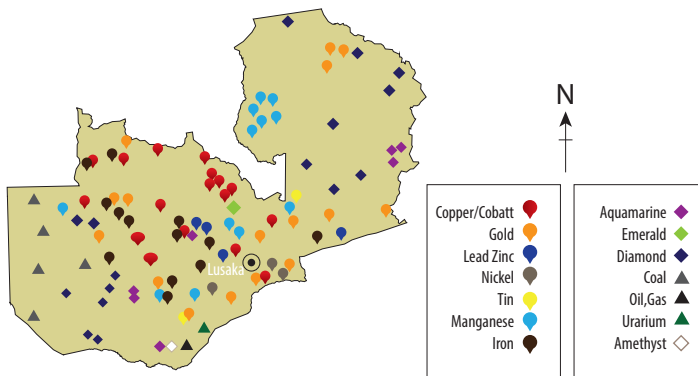
remain. Projections indicate that there will be continued high demand for copper leading to sustained high copper prices mainly due to urbanisation and growth in China and India. The continued investment in copper mining in Zambia and decline in global supply of copper are also likely to keep the price of copper high. This presents lucrative prospect for Zambia to formulate a policy strategy, which will maximise on these benefits (ERA Report, 2013).

Zambia also holds potential to utilize both backward/ up-stream linkages and forward/down-stream linkages along the mining value chain⁴, which it has failed to effectively do since the first Republic.

The first area requiring action is that expansion of mining activities themselves and of the levels of productivity in the mining sector. This is crucial in order to continue generating revenue, which can then be used for re-investment in other sectors (fiscal linkages).

The mining sector continues to be dominated by copper mining in spite of the presence of other mineral deposits within the country (See Figure 11). Zambia for example imports steel and yet possesses in excess of 500 metric tonnes of iron. Zambia also has manganese deposits in the Luapula province, which could be used for battery manufacture (Nyambe and Phiri, 2010). Such activities would help diversify the economy away from copper and would also create jobs and wealth for the country.

Figure 11: Zambia's Mineral Deposits

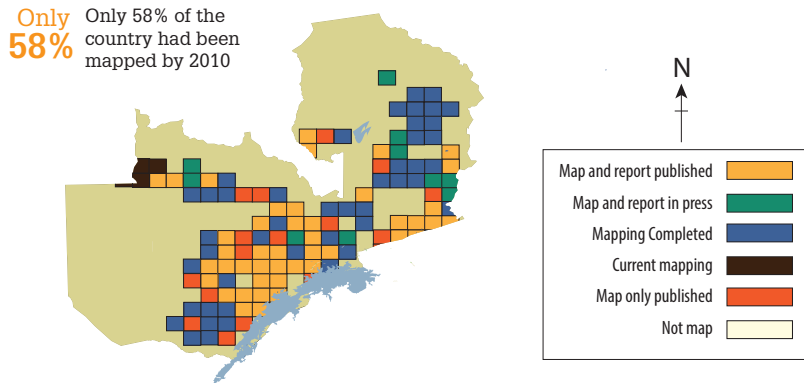


Source: Nyambe and Phiri (2010)

⁴ Up-stream /backward linkages refer to input supply relationships into mining at any point in the mining value chain (exploration, development, processing, refining and value addition) while forward linkages entail value addition and processing of commodities.

Investment in other metallic minerals is however constrained by the lack of adequate information on mineral availability. Even though Government has made efforts to increase the geologically mapped surface area of the country, much more remains to be done as only 58% of the country had been mapped by 2010 (See Figure 12 Below).

Figure 12: Geologically mapped regions in Zambia



Source: Nyambe and Phiri (2010)

The 2011 Annual Progress Report on the SNDP also shows that even though the target of establishing a mineral resource database was set in 2011, this was not done and only Luapula province was mapped out of a target of four quarters. Zambia therefore loses out on investment due to lack of accurate information on mineral availability within the country.

The process of issuing licenses also needs to be expedited as the lack of licenses prevents mining companies from beginning or proceeding with mining operations. The delays in issuing licenses may also lead to loss of employment for local workers if investors abandon the project and may also constitute a running cost to investors as projects may be required to run for a longer time frame than planned.

Another critical need is that of human capital development in Zambia. The Manufacturing Sector Survey of 2001-2002, revealed that 35% of manufacturing firms identified shortages in skilled manpower and low productivity as a major constraint in business while 17% classified it as a 'chronic problem.' (MCTI, 2007). This calls for restructuring of the educational system particularly curricula at tertiary level to be more responsive to industrial needs thus strengthening the links between the two sectors.

Mining linkages to manufacturing have also remained low with regards to both supplying manufactured inputs to the mines or value addition. Mineral processing facilities, for instance, remained constant at twenty-two between 2009 and 2011 (2011 Annual Progress Reports, 2012). Moreover, Zambia only utilizes 25% of its manufacturing capacity (MCTI, 2007). On one hand, some scholars have argued that value addition beyond smelting and refining would not benefit Zambia significantly due to distance from markets and technological and skills limitations (Hausmann, 2008, World Bank, 2011).

However, promotion of local manufacturing capacity both in terms of ensuring access to financial resources by Small and Medium sized Enterprises (SMEs) and building their technical skills and administrative capacity to supply the mines with consumables is a viable option (World Bank, 2010). The SMEs would manufacture inputs for which they would have a ready market – the mines. Currently the mines incur significant expenses in importing inputs from abroad. While some of these imports are complex, hi-tech goods, which local producers lack capacity to produce, others are consumables, which local producers could manufacture, such as mill balls and other services.

Lastly, the high costs of doing business must be reduced to attract manufacturers to the industry. High costs of electricity, fuel, tariffs as well as acute skills shortage in the mining sector must be addressed to counter high labour and operational costs by mining companies.

Conclusion

Zambia's mining sector holds considerable potential to boost self-sustaining growth in other sectors of the economy through employment and wealth creation. Past governments in Zambia's history have failed to adequately tap into this potential, future opportunities remain. Key aspects in forming linkages are a comprehensive policy framework that links education to industrial needs (human capital development); build up of manufacturing capacity along the mining value chain; and increased geological mapping and exploration.

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In the **Mining Background Note (BN)** entitled **“Mining; leveraging from backward and forward linkages for diversified growth and wealth creation”**, PMRC assesses the various approaches to mining and country development in Zambia from the colonial era to date. The BN identifies **Zambia’s significant mineral potential and economic benefits that have resulted from a thriving copper industry**. However, it also illustrates that the mining sector has not attained its full potential on poverty reduction, diversified growth or job creation in Zambia. **PMRC observes that the absence of a robust, comprehensive mining policy framework that effectively links mining, to other sectors of the economy such as manufacturing, education and skills training and agriculture** has been a significant inhibitor to the attainment of full potential in the mining sector. In view of the foregoing PMRC recommends the **formulation of a decisive, comprehensive policy framework** which; encourages diversification in the economy through **creation of strong backward and forward linkages between mining and other sectors; provides a clear strategy for human capital development in mining; provides for expansion of mining activities and increased productivity levels within the mining sector.**

MINING; LEVERAGING FROM BACKWARD AND FORWARD
LINKAGES FOR DIVERSIFIED GROWTH AND WEALTH CREATION



Unlocking Zambia's Potential

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