



## PROSPECTS FOR INDUSTRIAL TRANSFORMATION IN SADC

### Towards a Regional Strategy and Roadmap

## Mining Sector and Prospects for Beneficiation

### Introduction

The majority of countries in the SADC region are endowed with vast mineral resources. Between them, South Africa and Zimbabwe are host to approximately 80 percent of the world's Platinum Group Minerals (PGMs) and chromite resources.

Vast deposits of coal, both thermal and metallurgical, occur and are mined in significant quantities in Botswana, Malawi, Mozambique, South Africa, Zimbabwe and Zambia. Angola, Botswana, the Democratic Republic of Congo (DRC), Namibia, South Africa and Zimbabwe provide approximately 60 percent of the world's rough diamonds.

Base metals, especially nickel and/or copper, are extracted profitably in Botswana, the DRC, South Africa, Zambia and Zimbabwe. Other mineral products are extracted from ore deposits which occur in large proportions in SADC countries and these include aluminium, uranium, gold, iron ore, asbestos, tin, fluor spar, manganese, limestone and zinc.

The energy mix and challenges currently afflicting the region could be addressed through exploitation of the natural, shale and coal bed methane gas deposits that have been discovered in Botswana, Malawi, Mozambique, Namibia, South Africa, Tanzania and Zimbabwe in recent years.

The mineral resources provide the SADC region with a comparative advantage and also present a springboard for socio-economic development of the countries. For example, given the growing demand for platinum as a catalyst in reducing air pollution and in jewellery, increased production of Platinum Group Metals (PGMs), their beneficiation and value addition would present a unique opportunity for developing world class mines and processing facilities which could form the backbone of vibrant metallurgical and manufacturing industries.

The challenge for SADC is how to turn its comparative advantage, which is based on its mineral resources, into a competitive advantage.

For its economic transformation to be sustainable, it is important that SADC industrialises while placing emphasis on innovation. In the case of Zimbabwe, the Government has launched the Zimbabwe Agenda for Sustainable Socio-Economic Transformation (ZimAsset) as its guiding economic blueprint and one of its four main pillars is Beneficiation and Value Addition of the country's natural resources.

There are however, some fundamental questions to be answered in the quest to achieve the African Mining Vision and these include;

- what are the exact quantities and location of the minerals in each country, economic block or region?
- what is the capital value of the mineral resources in each country?

While the first question could well be answered by conducting extensive exploration employing accurate methods in each country or region, the second question is one that sparks debate with limited convergence depending on whether one is a producer or receiver/consumer of minerals.

### The case for beneficiation and value addition

In this context, beneficiation of minerals is the processing of mined ore to separate valuable mineral products from the associated waste rock or impurities. The extent to which this is done determines whether the product is intermediate in its purity and should be processed further or is refined, ready for further value addition through manufacturing. Some of the compelling reasons to support beneficiation and value addition are discussed hereunder.

### ***Fluctuation of mineral commodity prices.***

The frequent decline in mineral commodity prices, which is often beyond the control of SADC producing countries, is one major reason why beneficiation and value addition of their minerals is important.

It is common knowledge that the prices of jewellery, electronic products, etc. seldom fall in response to the drop in the prices of gold, platinum or related metals from which the products are made.

For example, the price of Platinum has been showing downward trend in recent years despite the fact that the demand for auto-catalysts continues to rise and the prices of vehicles fitted with those products is not decreasing in sympathy with that of platinum. This example therefore supports, to some extent, the argument that value addition to end uses or applications would have the effect of cushioning producers from price fluctuations.

***Employment Creation.*** The potential employment and downstream economic benefits undoubtedly favour development of mineral beneficiation facilities in SADC. Some countries in the region have witnessed a dramatic fall in employment levels and migration of skills as beneficiation and manufacturing activities migrated to other countries mainly outside SADC.

***Maximising Revenue and Profit Margins.*** It is often the case that the value of primary products such as rough diamonds is several times less than that of finished products such as polished and cut diamonds or jewellery.

***Preventing Transfer Pricing.*** Internationally, cases have been noted where multinational companies have been accused of transfer pricing across national borders and it is clear that the companies operating in SADC would be keen to avoid such suspicions. It is therefore, in those companies' interests to protect their corporate images by beneficiating and adding value to minerals in the countries or the regions in which they are extracted.

The recent (2013) relocation of the De Beers Diamond Trading Centre from London to Gaborone is one example of confidence-building in line with international best practice. SADC should encourage similar developments.

A common theme in international principles which include the African Mining Vision, the Extractive Industries Transparency Initiative (EITI), the Natural Resources Charter and the United Nations Guiding Principles on Business and Human Rights, is that fiscal policies and contractual terms should ensure that each coun-

try gets full benefit from its resources, subject to attracting the investment necessary to realize that benefit.

***Expansion of Capacity to Meet Demand.*** Failure to cope with rising demand results in the market shifting resources to the development of alternatives as well as technologies to recycle materials thus becoming self-sufficient and threatening the long term viability of the primary production business.

In Zimbabwe, for example, the case for base metal and precious metal refining is overwhelming, especially given the vast PGM resources in the country. It is clear that, as production capacity continues to increase, the capacity of the refineries in South Africa will be saturated.

***Provision of Inputs for Downstream Industries/Manufacturing.*** Local beneficiation and value addition is important in that it provides the feedstock for manufacturing and industrialisation, which in turn supplies equipment and machinery for the mining, beneficiation and value addition processes.

### **How should SADC implement beneficiation and value addition?**

It is imperative that SADC, should leverage its comparative advantage based on natural resources and create a strong supporting cluster around value addition and beneficiation of those resources.

Successful implementation of the industrialisation policy should lead to the creation of world class companies that compete in the global marketplace. It is therefore, important that the region opens up to international ideas, experiences and expertise of those that have done it successfully so that there is no re-invention of the wheel.

As SADC unlocks the wealth derived from its mineral and other natural resources, it is prudent that it adopts the special economic zones model which allows it to implement new economic transformation ideas while managing the risks that may be associated with such innovation. Madakufamba (2014) noted that since the 1980s, Special Economic Zones were introduced in China through careful experimentation, notably starting in Guangdong Province where the remarkable story of Shenzhen was turned from what was once a fishing village into an ultra-modern industrial city.

***Promote Investment in the Mining Sector.*** Mining and beneficiation of minerals is generally capital intensive and it is imperative that governments in the region put in place and implement policies that attract international investors

as well as promote investment in the sector by indigenous people.

The socio-economic benefits of such investment and development include increased revenue inflows, industrialisation and employment levels. However, an impediment to mutually beneficial investment is often the lack of information on the quantity and quality of the mineral deposits.

**Exploration.** An important step in adding momentum to mining, beneficiation and value addition, and therefore, industrialisation is the determination of the level of mineral endowment in each country in the region through exploration. Modern methods of exploration, especially airborne, could be implemented on a collaborative basis by neighbouring countries in the SADC region.

Linked closely with this exploration is the need to create computerised databases and to evaluate the capital value of mineral resources revealed by the exploration efforts.

**Beneficiation and Value-Addition.** It is critical that the sector adopts technologies which are efficient and cost effective so that value is not discarded together with waste. There is abundant evidence in the region of such inefficiency in the form of high value dumps which are constantly being re-processed. It is of critical importance that mineral producers in the SADC region remain competitive in terms of productivity, economies of scale and related costs of production as this will guarantee fairly priced inputs for the downstream manufacturing industries.

Companies currently involved with large scale mining should be encouraged, through fiscal incentives and taxation to progressively move towards full-scale beneficiation and value-addition as close to the extraction point as possible.

If a mining company chooses to concentrate on its primary and core business of mining and minimal beneficiation, then it should be encouraged to facilitate downstream processes by other players including local communities and small scale enterprises.

The region therefore requires aligned policies, programmes and action plans to achieve satisfactory levels of mineral beneficiation and value addition.

**Support for Small-scale enterprises.** Artisanal Small-Scale Mining (ASM) often precedes and provides valuable information for large scale mining and allows the exploitation of deposits that are not amenable to large-scale mining.

Small-scale enterprises focusing on value-addition such as diamond cutting and polishing, jewellery manufacturing and related occupations

are an important component of industrialisation as they provide incomes and contribute to socio-economic transformation.

Governments should promote capacity building (technical and management skills, expertise and equipment) amongst small scale miners and related entrepreneurs.

A critical barrier identified in the promotion of small scale mining and related entrepreneurship is the reluctance by financial institutions to fund small scale miners, especially women in mining.

Financial institutions tend to be concerned about the risk of non-payment of loans due to the lack of expertise by the small scale miners. A model should be developed to minimise this risk while maximizing productivity through provision technical and financial management expertise to recipients so that they have the capacity to pay back the loans received.

**Technical support, education, research and development institutions.** To provide a platform for sustainable mining, beneficiation and value addition, and indeed industrialisation of the national and regional economies, strong institutions should be put in place to champion education, research and development in such areas as:

- geology -- this will provide the knowledge required for effective exploration;
- mining -- especially rock mechanics, ventilation, technology, deep mining, etc;
- metallurgy -- beneficiation does not only ensure that the region maximises revenue from its mineral products, but also reduces transportation costs that arise from exporting low value commodities which are still in combination with significant impurities;
- analytical (chemistry);
- environmental management;
- design and manufacturing.

The Ministry of Mines and Mining Development in Zimbabwe has announced, plans to establish the Pan African Minerals University of Science and Technology (PAMUST) whose primary objective would be to act as a centre of excellence for mineral research and development, and higher education.

Linkages should be created between the regional and international mining universities and research and development institutions such as MINTEK of South Africa, and the mining industry at large.

**Management of industrial and community relations.** To minimise disruptions to production and continued progress towards industrialisation, governments and the private sector in the region should ensure that the industrial relations climate



on the mines are managed in a way that maximises productivity.

It is also important to ensure that organisations involved in extracting and beneficiating minerals engage the communities surrounding their operations and practice good Corporate Social Responsibility (CSR) programmes in order to maintain productive relations with the communities.

**Provision of enablers.** It goes without saying that the African Mining Vision (AU, 2009) may only be realised provided that governments and the private sector work together through smart partnerships that are Public Private Partnerships (PPPs) to provide key production enablers, chief among them being:

- **Energy** -- the SADC region is bedeviled by a critical shortage of power which results in the implementation of energy rationing schemes such as load shedding programmes and power outages. These have a negative bearing on plant and machinery maintenance, production and ability of exporting firms to fulfil orders. The construction of power stations should therefore, be a major priority if the industrialisation agenda has to yield any meaningful results.
- **Transport infrastructure** -- minerals and mineral products need to be transported between processing facilities, and also to the market. Provision of good roads, rail, ports and airport facilities is critical to the successful implementation of the industrialisation policy.
- **Information communication technologies** -- indeed information communication infrastruc-

ture is essential for efficient production and it facilitates real time online trading.

**Fostering sustainability.** Sustainability of operations may be achieved through:

- Community Based Ownership – the involvement of the community groups including women in which mining and/or beneficiation takes place ensures checks and balances by people with long term interests in both the business and the land.
- Good Environmental Management – responsible mining, beneficiation and land rehabilitation gives the industry a good public image and land to fall back on once the mineral resources have been exhausted.
- Good Health and Safety Management Practices – accident-free mining and beneficiation operations should be promoted by both Government and the private sector in order to boost morale and promote productivity at the workplaces

**Regional integration.** Some regional integration activities have already been implemented within the mining industry amongst SADC member countries, which highlights the opportunities for toll processing of mineral products, especially in processing of base metals, Platinum group metals, and by-products of coal.

Mining and beneficiation policies, regulations and administration procedures should be harmonised in the region and aligned to create a stable and predictable investment climate.

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